COAL MINING

"The Picture-Book of the Industry"

JULY 1949 VOLUME XXVI, No. 7

Roof Bolting

THE SIIS CLEVELAND STOPER IN ACTION

COMPLETE ROOF BOLTING SERVICE

- Compressors: Rubber, Track, and Skid Mounted
- SIIS Stoper for High and Low Seams
- Rotary Impact Wrenches
- Mine Roof Support Bolts, Plates, Wedges, Channels, Etc.
- Drill Steel, Bits, Roof Bolt Drivers
- Acme Machinery Co.
- LeRoi-Cleveland Rock Drill Co.
- Thor
- Oliver Iron & Steel Co.
- Iron City Spring Co.

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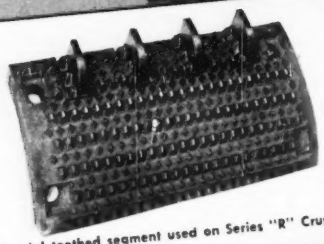
ACTUAL INSTALLATION EXPERIENCE IN OVER 35 MINES IN THE TRI-STATE AREA

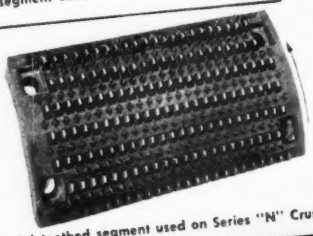
MOST SIZES *with* ONE CRUSHER

Jeffrey SINGLE ROLL

351-45

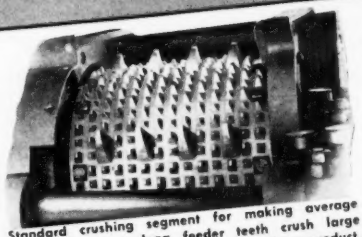


Special toothed segment used on Series "R" Crusher



Special toothed segment used on Series "N" Crusher

Whether it is the Single Roll Crusher for making the average range of sizes or the STOKERKOL Sizers for producing premium-size stoker coal you will find that Jeffrey Crushers are on your side in meeting many capacity and product requirements. Let us tell you about actual performance records.



Standard crushing segment for making average range of sizes — long feeder teeth crush large lumps — short crushing teeth give uniform product.

The **JEFFREY** MANUFACTURING COMPANY

969 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

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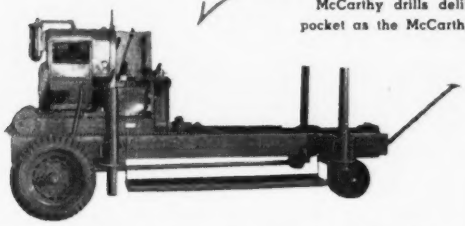
McCarthy Drills PAY OFF!

SELF-PROPELLED HORIZONTAL DRILL



McCarthy drills deliver 40% more holes per day! More money goes into your pocket as the McCarthy drills save time and labor on the job.

Operating effectively in clay, sandrock and soft limestone overburdens, McCarthy Horizontal Drills bore 1200 to 1800 feet per day, working easily to depths of 150 feet or more.

Maneuverable from one job to the next, the machine is adjustable to the necessary drilling angle and is available in self-propelled, truck-mounted or vertical models. Every McCarthy Drill pays its own way in record-breaking performance.

DOUBLE YOUR PRODUCTION

HEAVY – RUGGED – POWERFUL

VERTICAL DRILL

The McCarthy Vertical Drill makes "dry" holes ready for tamping and it makes them fast. This drill bores 400 to 1000 feet per day.

Through shale, sandrock or soft limestone formations, McCarthy drills quickly penetrate to depths of 100 feet or more. Adaptable to high wall, key drilling and diamond drill boring. Write for the full story today.

Hydraulically controlled derrick and 60 horsepower gasoline motor are standard equipment. All McCarthy Drills can be equipped with electric motors.

INCREASE YOUR PROFITS

HEAVY – RUGGED – POWERFUL

COAL RECOVERY DRILL

McCarthy Coal Drills by-pass overburden, drill right into the heart of the seam. These drills produce from 60 to 110 tons of coal per day. In one mine where thick overburden made further stripping impractical, three men took a McCarthy Bonus Drill and pulled out 7 tons of clean, dirt-free coal in only 35 minutes!

The rugged augers are made in 6 foot interlocking sections, are available in 12, 16, 20, 24, 30 and 36 inch diameters.

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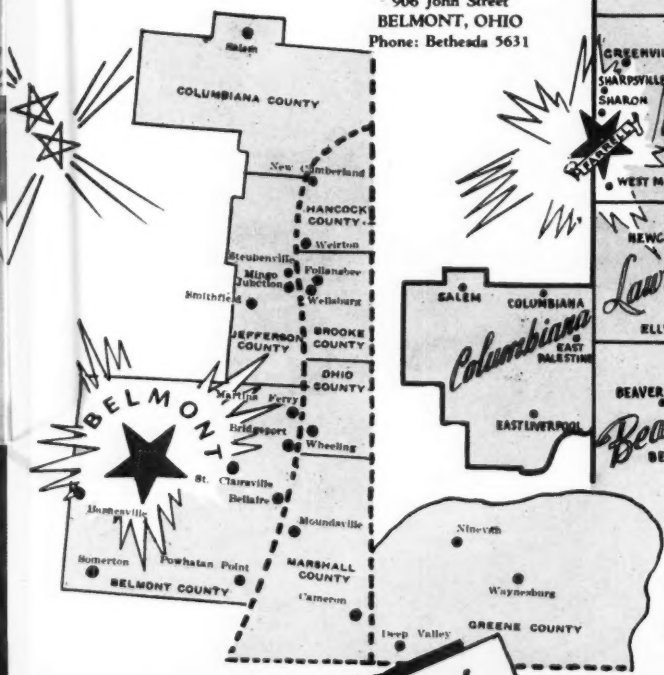

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ON THE CATERPILLAR *Map*

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As "Caterpillar" owners increase, so must facilities and abilities to serve them grow.

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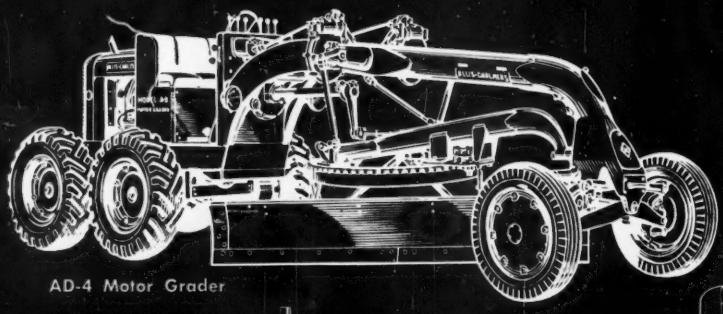
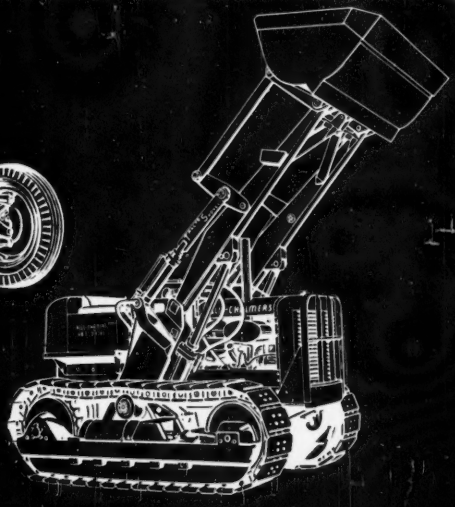
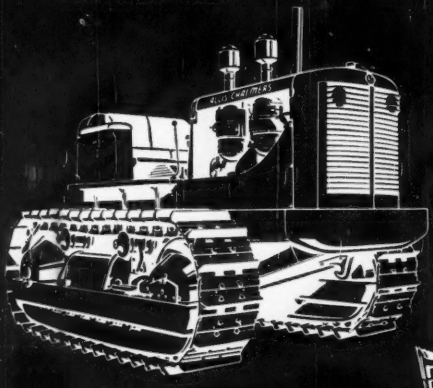


AD-4 Motor Grader

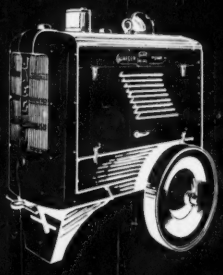


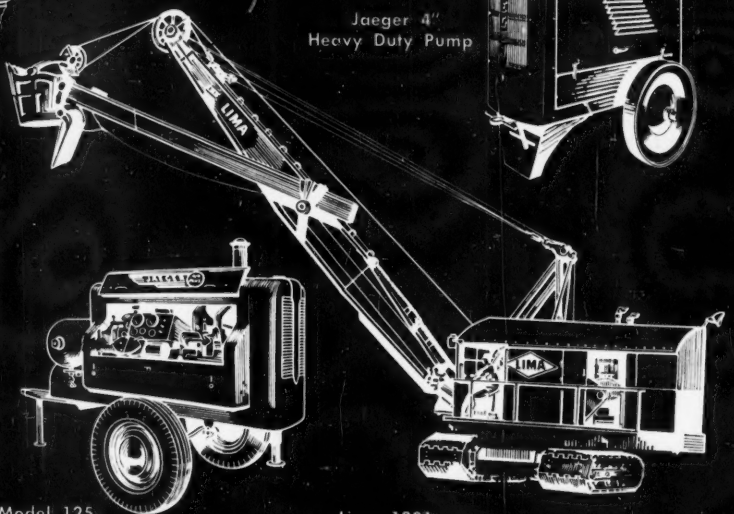
HD-5 with Tracto-Shovel

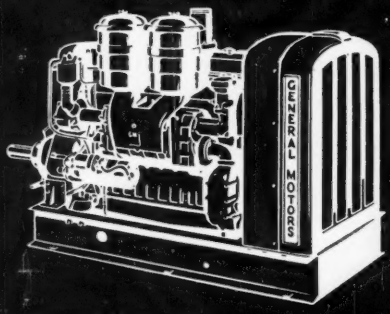


HD-19 Tractor

Jaeger 4"
Heavy Duty Pump







General Motors Diesel

Jaeger Model 125

Lima 1201

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COAL MINING

VOL. XXVI JULY, 1949 No. 7

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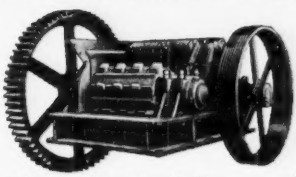
McLANAHAN GIANT ROCKMASTER COAL AND ROCK CRUSHERS

● RUGGED ● DEPENDABLE ● ECONOMICAL



McLanahan Rockmaster with Hopper removed.

Built for heavy duty—Patented Automatic Steelstrut Toggle for tramp iron protection, reversible and interchangeable crushing plates, quick adjustment of sizes. Babbitt or split bronze bearings. Steel constructed throughout for longer, trouble-free service life.

Descriptive Bulletin on request

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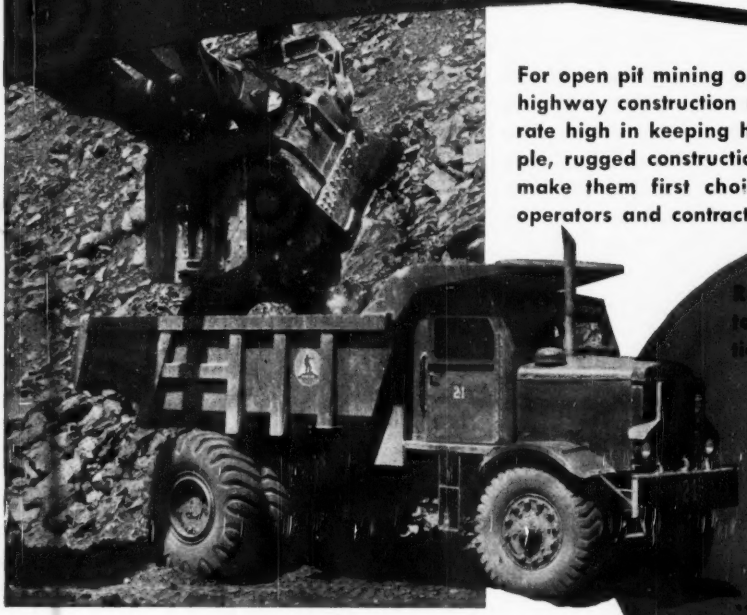
Pit, Mine and Quarry Equipment Headquarters
Since 1835
HOLLIDAYSBURG, PENNSYLVANIA

"EUCS" ARE THE PACE SETTERS for PROFITS



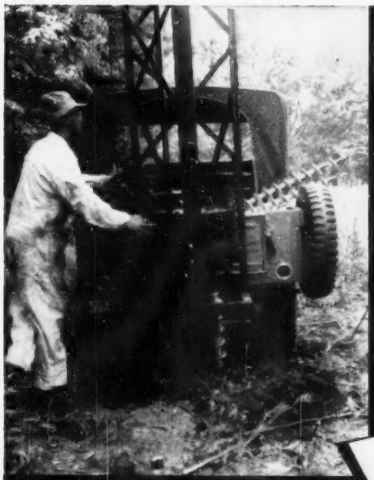
For open pit mining operations, quarries, off-the-highway construction and industrial jobs, Euclids rate high in keeping hauling costs low. The simple, rugged construction and long life of "Eucs" make them first choice of many leading mine operators and contractors.

Rear-Dump Euclids, of 15 to 30-ton payload capacities, have body designs for low cost hauling of all types of materials. Their rugged construction withstands the impacts of loading heavy excavation and hauling over rough roads. Unmatched for efficiency on haul road and dump... low maintenance costs ... large tires for excellent traction and flotation... wide range of travel speeds up to 35.4 m.p.h. ... powered by Diesel engine up to 275 h.p. rating.

Engineered and built as a complete unit, Euclid Bottom-Dump Coal Haulers have proper weight distribution, tremendous power and ease of handling. Short wheelbase of tractor and the universal hitch design permit short turns in narrow cuts. Adjustable form fitting seat affords good driver comfort ... powered by Diesel engines up to 275 h.p. rating ... loaded speeds up to 32.3 m.p.h. ... available in 20 to 40-ton payload capacities.

THE EUCLID ROAD MACHINERY CO. CLEVELAND 17, OHI

EUCLIDS Move the Earth



Vertical Position testing for coal at Indiana Mine. Augur size 4½", 5". Depth drilled 41 feet. Material . . . shale, Indiana sandstone, hardpan, coal. TIME IN AND OUT, 70 MINUTES.

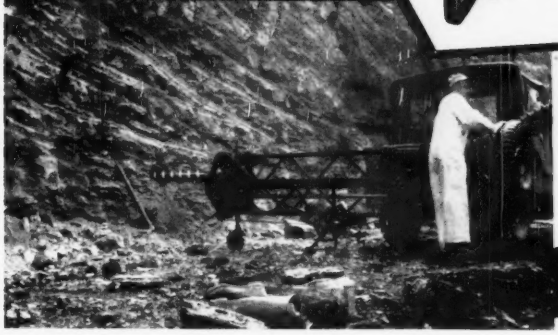
THE NEW MOBILE DRILL

Two FOR One

at the LOW PRICE of

$995.00

(plus $350 for the horizontal adapter)



Horizontal Drilling of overburden at Maria Hill Coal Company. Size of hole, 6". Total depth, 60 feet. Material . . . shale. TIME IN AND OUT 90 MINUTES.

● These . . UNRETOUCHED PHOTOGRAPHS . . show the new MOBILE DRILL . . in action in the field. There never has been as economical a piece of equipment for . . PROSPECTING . . WILDCATING . . OR A PLAIN WORKHORSE FOR SHOOTING OVERBURDEN . . as this drill. It . . COSTS LESS . . complete with adapter and a brand new Jeep . . than you would expect to pay for either a vertical or horizontal drill . . EXCLUSIVE OF MOTIVE POWER OR MOVING EQUIPMENT. THE NEW MOBILE DRILL IS THE ONE PIECE OF EQUIPMENT YOU *NEED.*

ONE MAN . . can operate, moving over the roughest terrain into the most inaccessible spots . . without dismantling. It takes only five minutes to move from vertical to horizontal position. Wherever your man stops . . the MOBILE DRILL IS READY TO GO TO WORK.

Its STURDY STEEL TOWER . . is only 7 feet 4 inches high to permit passage under bridges. All moving parts are of the finest quality. THE NEW MOBILE DRILL . . IS BETTER . . COSTS LESS . . FREES MOTIVE EQUIPMENT FOR OTHER DUTIES . . CUTS DRILLING COSTS IN HALF.

Write for Further Information or Location of Nearest Demonstration Point

MOBILE DRILLING, INCORPORATED

960 N. PENNSYLVANIA STREET

INDIANAPOLIS 4 INDIANA

New R and S Froth Flotation Hydrotator

UNVEILED AT 1949 COAL SHOW IN CLEVELAND

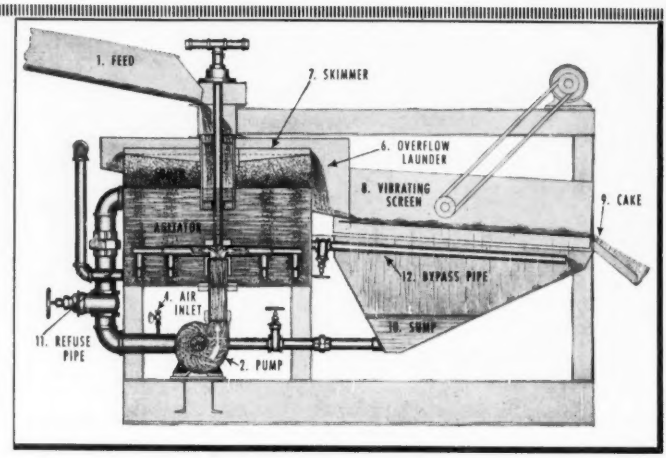
★ *RECOVERS MARKETABLE COAL FROM SLUDGE ORDINARILY WORTHLESS* ★ *RECOVERS COAL WITHOUT SETTLING*
★ *MINIMIZES POLLUTION OF STREAMS AND RIVERS*

What it Does

The new R and S Froth Flotation Hydrotator cleans and separates fine coal from sludge formerly considered of no commercial value.

It recovers coal without settling; yet the equipment occupies only a fraction of the space required by a thickener large enough to effect similar recovery by gravity. Froth is killed instantly and delivered in cake form.

Water is clarified and pollution of streams and rivers is minimized—important today in view of increasing government regulation on this point.



How it Works

1 After suitable conditioning, coal enters tank through Feed Chute and Feed Well.

2 Circulating Pump takes water from side of main tank and delivers it to tank bottom through . . .

3 Agitator, which distributes circulating water and coal uniformly over tank bottom, from where they rise to pump intake level.

4 Air is drawn into pump through a valve, is distributed over bottom with water and coal. Coal rises with air bubbles as . . .

5 Froth, which overflows into . . .

6 Overflow Launder, with aid of . . .

7 Skimmer, attached to rotating Feed Well and Agitator. Froth flows to . . .

8 Vibrating Screen, which "kills" froth and delivers it as . . .

9 Cake (low ash and dewatered). Water and entrained high ash coal, together with excess reagent, pass screen to . . .

10 Sump, where they join pump circulation and are returned to main tank.

11 Refuse, with all excess water from feed, is discharged from tank bottom by adjustable tube which controls level of water below frothing zone.

12 Bypass pipe to provide sluicing water.

Result of Years of Study

Incorporated in the R and S Froth Flotation Hydrotator are features developed by R and S engineers through years of study and experiment. Every important detail of this new unit has been checked and rechecked under actual operating conditions in Roberts and Schaefer Company's own plant.

Testing Plant Service

In addition to its experimental laboratory function, the R and S Testing Plant is available for testing carload samples representative of your actual production. Users of this service receive a detailed report which includes: (1) Complete screening test showing percentages of various sizes; (2) Cleaning test on each size, showing raw coal, cleaned coal and refuse with ash and sulphur percentages on each and rejection obtained; (3) Complete float-and-sink determination on total sample with theoretical washability curve; and (4) Conclusions and recommendations. If desired, the entire car of cleaned coal may be reshipped for further full scale coking or boiler plant tests. The only charges are for labor and power—no charge for engineers' services.

More Information

For complete details on this new Roberts and Schaefer equipment, for information on Testing Plant Service, and for competent counsel on your individual coal preparation operations, get in touch with R and S engineers. They can help you make prepared coal profitable coal.

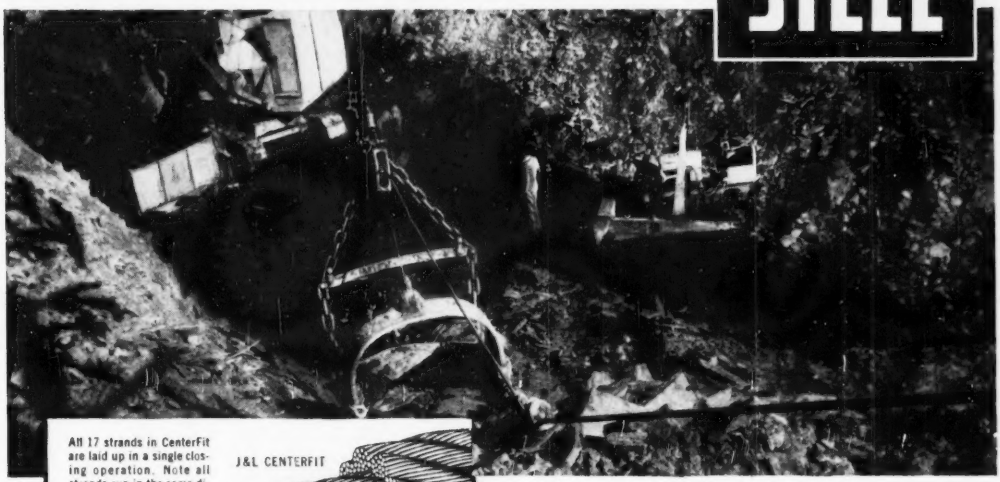
As a step in the right direction, why not send for the full story of the new Froth Flotation Hydrotator. Write for Bulletin No. 172 . . . today.

ROBERTS and SCHAEFER CO.

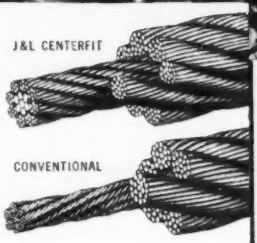
130 North Wells Street, Chicago 6, Illinois
2801 Broadway Avenue, Pittsburgh 16, Pennsylvania
P. O. Box 570, Huntington 10, West Virginia
254 West 54th Street, New York 19, New York

GILLESPIE COAL COMPANY gets 30% Longer Service with J&L CenterFit Wire Rope

J&L STEEL



All 17 strands in CenterFit are laid up in a single closing operation. Note all strands run in the same direction. Outside strands fit snugly into valleys between inside strands and eliminate crossing of strands as in conventional design. This prevents internal nicking—gives longer wear. Eight outside strands (CenterFit design) give more steel, less void space, greater flexibility, easier handling.



J&L CenterFit drag cable as seen from the fairlead sheave of a Marion 40-A dragline. The 3-yd. bucket is removing overburden from coal seam.

The "right wire rope for the job" pays off in longer service, reduced maintenance and greater profits.

A 30% average increase in service life! That's the performance record reported by Gillespie Coal Company when J&L CenterFit wire rope replaced a conventional dragline cable on a Marion 40-A dragline equipped with a 3-yd. bucket at its Lyons, Ind., open pit coal mine.

Average life of a conventional 6x19 dragline was 12 to 15 days; with CenterFit it was 17 to 22 days!

J&L CenterFit wire rope was selected for this application as a result of a careful analysis of operating conditions at the Lyons mine by Mr. L. S. Shaffer, J&L wire rope distributor in Brazil, Indiana. He knew the CenterFit design—exclusive with J&L—would provide the greater flexibility required for long service life on the small diameter sheaves and drums of this dragline. Actual performance records *proved* that CenterFit was *the right rope for this particular job.*

Perhaps you, too, can use J&L CenterFit wire rope to advantage. In many places it gives improved performance and longer service.

We have just issued a new handbook, *"Wire Rope Is a Machine."* This 96-page illustrated, pocket-size book is written *for the man on the job.* Tells how to select the correct wire rope . . . How to install, operate and maintain wire rope for maximum service. If you use wire rope, we'll gladly send you a copy. The coupon is for your convenience.

Jones & Laughlin Steel Corporation
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Pittsburgh 19, Pa.

Please send me a free copy of your new handbook, "Wire Rope Is a Machine."

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JONES & LAUGHLIN STEEL CORPORATION

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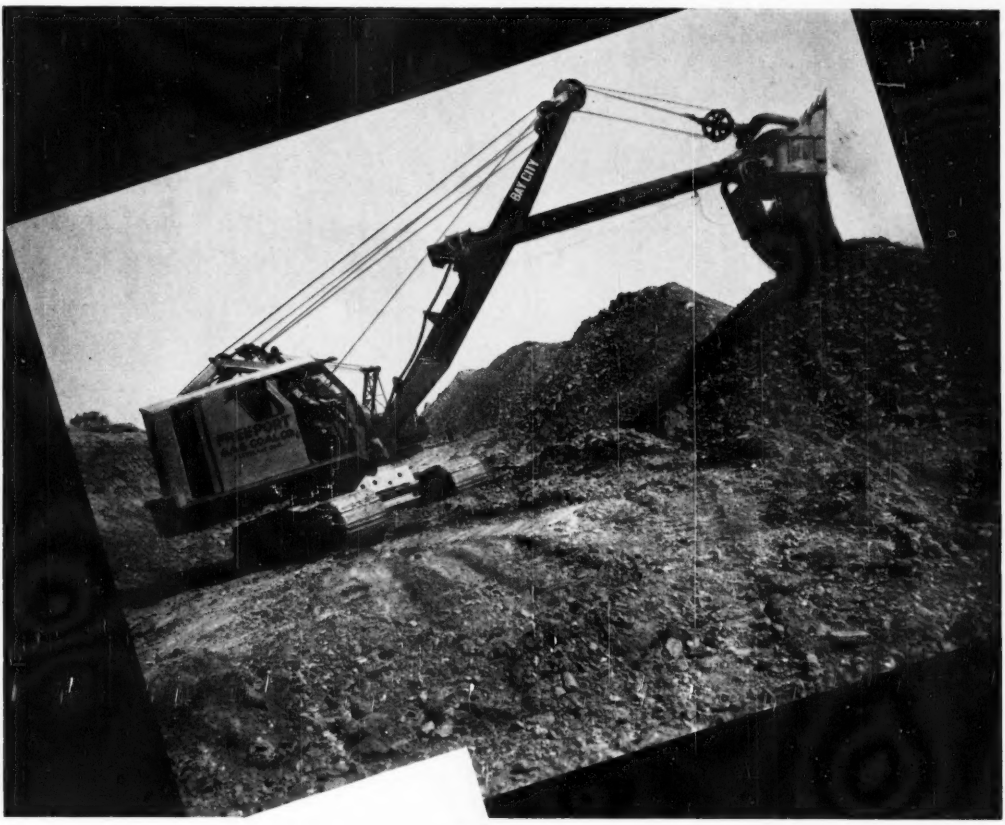


FAST STRIPPER WITH A BIG DIPPER . . . BAY CITY 65

Strip mine owners find that overburden presents no problem when there's a BAY CITY 65 on the job. This 65 working an Ohio strip mine near Coshocton is equipped with 25' boom, 20' stick and 1 1/4 yard dipper to get wide working ranges and long reach. Like all BAY CITY machines, the 65 is built to last and has **all** the advanced engineering refinements . . . tandem drums on separate shafts . . . quiet helical gears . . . quick, responsive control clutches . . . unit-cast alloy steel base. The 65 is a shovel that will give you your money's worth in speed, power, and durability . . . and will save you money on operating and maintenance costs. Why not put one to work for you? Write, wire, or phone for complete facts.

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

BAY CITY SHOVELS INC., BAY CITY, MICHIGAN See your nearest Bay City dealer for excavating and material handling equipment in sizes from ⅜ to 1¼ yard with crane rating up to 20 tons. Both crawler and pneumatic tire mountings.

DO YOU KNOW

Daily gentle massage of the scalp followed by brushing and frequent shampoos make up the anti-dandruff treatment advised by the American Medical Association.

* * * *

These measures "faithfully executed will be of considerable value" in controlling dandruff, the AMA committee on cosmetics states in a report appearing in the forthcoming issue of the association's journal.

* * *

Hair tonics and other preparations and treatments for hair and scalp, including treatments for baldness, are debunked in the report which indicates they are a waste of money.

* * * *

If you boss people and you want to get production, don't just harp on more work in less time—be genuinely interested in the people who are working for you.

* * * *

That is one of the lessons that psychologists learned at the University of Michigan's Survey Research Center in an investigation directed by Dr. Rensis Likert.

The Supervisor whose employees turned out the greatest amount of work, the scientists found, is himself concerned primarily with the people working under him.

* * * *

Pressuring for production may work to some degree. But the best results are achieved when a worker's internal motivations are tapped—his self-expression, self-determination, and sense of personal worth. A person works better when he is treated as a personality, given some degree of freedom in the way he does his work, and allowed to make his own decisions.

* * * *

Mercury vapor instead of steam is used to drive a turbine installed by the Hartford Electric Light Company. It is said to be the first commercial installation of a mercury turbine-generator.

The installation includes a mercury

* * * *

boiler in which this liquid metal, sometimes called quicksilver, is heated into vapor, just as water is heated into steam. The mercury vapor not only will turn the turbine which in turn drives the electric generator, but also will supply extra heat, which will be used to produce steam for other turbine-generators.

* * * *

The mercury vapor turbine-generator was built by General Electric. Others are under construction for installations in various parts of the country, GE engineers state. This installation is capable of producing 15,000 kilowats of electricity and also 200,000 pounds of steam at a pressure of 400 pounds per square inch.

* * * *

A blanket of warm air from the furnace spread over the walls of a room is the feature of a new home-heating system demonstrated at the exposition of the National Association of Home Builders. It is a General Electric development, and said to be efficient and economical.

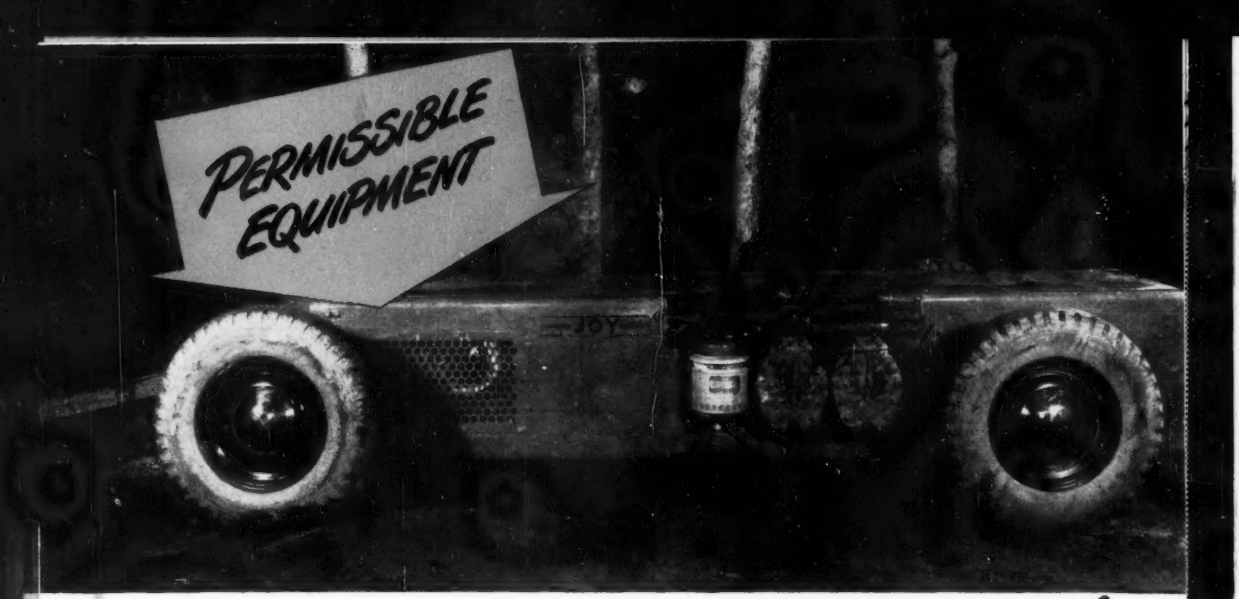
Here and There . . . .

The National Coal Association has announced that the NCA Board of Directors elected L. Russel Kelce, Kansas City, to succeed the late Grant Stauffer on the board, and named Joseph T. Berta, Philadelphia, to replace Charles O'Neill, another board member recently lost by death. These new Directors are sons of coal miners.

L. Russell Kelce, who was recently made President of Sinclair Coal Co., is the son, grandson and great-grandson of coal miners. After working at the mines during school vacations, he entered the surface-mining field at the age of 17 and became a mine superintendent at 19. Then—in 1920, when he was only 23—he engineered and help finance a "strip" mine in Oklahoma. Since 1924 he has been affiliated with the Sinclair interests, which have mining operations in Alabama, Illinois, Kansas, Kentucky, Missouri and Oklahoma, and last month rose to the presidency after having served 18 years as vice president in charge of all properties.

Joseph T. Berta, the other new NCA Director, is President of the Pennsylvania Coal & Coke Corp. directing bituminous coal mining operations, centered in Cambria and Clearfield Counties of Pennsylvania, and managing the company's sales program. The son of a coal miner, Mr. Berta has been associated with the industry for many years. His career started in the Illinois mines when he was 12 years of age. Later he transferred from the operating to the sales end of the business. In 1920, he became head of the city sales dpartmnt, Chicago, Wilmington & Franklin Coal Co., and in 1928 moved to Philadelphia to join the staff of the Philadelphia & Reading Coal & Iron Co. He served that firm as General Sales Manager until early 1947, resigning then to accept his present position.

J. J. Forbes, Director, Bureau of Mines, Washington, D. C., presenting Holmes Safety Award to the Honorable Richard Maize, Chief, Dept. of Mines for Pennsylvania.



ROOF-BOLTING TEAM!

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★ JOY COMPRESSORS . . . B of M-approved, and less than 30″ high. Rubber tire and track models, either self-propelled or draw-bar types. Two sizes: 130 or 175 CFM at 115 PSI. Compressors are two-stage, single acting, air-cooled—highly efficient and reliable.

★ JOY STOPERS . . . Complete line down to 21″ high for roof-bolting applications. These stopers do the entire job: drill the hole, drive the bolt and wedge—and as an *exclusive* feature, have a built-in torque wrench for tightening the nut.

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ROOF SUSPENSION SUPPORTS*

By Arthur Metcalfe†

Jackhammer being used as stoper in drilling for pin timbering.

INTRODUCTION

History records that the first commercial coal mine was opened in this country in 1750 on the James River, near Richmond, Virginia. Since then the coal-mining industry in the United States has made great advances in almost all phases of underground operations except roof support. Ventilation is now an exact science; safer and more efficient explosives are used; and electricity can be utilized safely to mine, load, and transport coal. The basic precautions necessary to prevent gas or dust explosions are known; the chief obstacle to overcome is to have the safeguards applied. The industry has attained a slight reduction in the frequency of roof-fall accidents in the past 15 years, during a period when the increase in mechanization of coal mines has been most rapid. This reduction has been accomplished through safety education, adherence to systematic timbering methods regardless of the appearance of the roof, and concentration of underground activities accompanied by closer face supervision.

How effective will the present method of roof support be when continuous mining machines are applied to coal beds that do not have strong roof? Let us not delude ourselves as to the consequences of the use of such machines unless improved methods of roof support are instituted. These machines will involve large capital investment and their successful application will depend upon continuous operation. It is almost inevitable that short cuts will be attempted with present timbering practices to achieve continuous operation; accordingly it is reasonable to predict that an increase in roof-fall accidents may occur. Most mining men will agree that at least 75 per cent of all conventional timbering used even with the present systems of mining is a continual compromise between expediency and safety. Basically, the methods of roof support have not changed since mining began. Some new support materials, such as steel or aluminum alloys, have been developed, together with newer methods of application, but in general the methods do not prevent the roof strata from breaking. Instead, they depend on holding the weight of the loosened roof material by wedging supports between the floor and roof or from intermediate points, such as hitches in ribs, or through iron pins inserted into holes bored in the ribs.

Falls of roof and coal cause about one-half of the fatal and one-fourth of the nonfatal accidents that occur annually in bituminous coal mines. With a view to preventing roof falls and the resultant personal injuries the Bureau of Mines advocates the application of roof suspension supports. Questions frequently asked where mining men assemble is "What about this roof-suspension-support affair," "What is it, how does it work," "Will it work in my mine?" The questions are followed by such statements as "We have the worst roof in the country,"—"It can't work here because we use large steel beams or wooden timbers, yet they bend or break and we still have roof falls that obstruct the entries and are very costly to clean up and remove to the surface dumps." As stated heretofore, timber-beam roof supports lack the rigidity necessary to prevent the flexure of the immediate roof which permits sag or flexure in the overlying strata that result in failure.

The Roof-Suspension-Support Method

The roof - suspension - support method involves reinforcement of roof material to provide additional beam strength. As applied to coal mining, it is possible to tie or bind together several thinly bedded rocks to simulate a thick bed, thus providing a competent beam of roof material from "rib-to-rib" across an opening to prevent flexure of the immediate roof, this in turn will minimize or prevent falls of roof. The roof-suspension-support method has been applied effectively for more than 20 years in the mines of the St. Joseph Lead Company in southeastern Missouri. The Bureau of Mines considers it still in the experimental stage for coal-mine application, and study and experiments are continu-

*Paper presented at the annual meeting of the Mine Inspectors' Institute of America, Pittsburgh, Pennsylvania, June 11, 1949.

†Coal Mine Inspector, Coal-Mine Inspection Branch, Bureau of Mines, Fairmont, West Virginia.

Pin timbering in rock roof at a Central Pennsylvania mine.

ing; however, the method has been applied successfully to many strata combinations in a number of bituminous-coal mines east of the Mississippi River. It is estimated that, during the past two years, this type of roof support has been installed in more than 50 miles of passageways in bituminous-coal mines, some of which have very difficult roof conditions to overcome. Personnel of the Bureau of Mines has kept in very close touch with all of these installations, and to date only two lost-time accidents from falls of roof have been reported from areas in mines where the supports are installed.

Determination of the Practicability of Roof Suspension Supports

The practicability of applying roof suspension supports will depend primarily upon the ability to secure good anchorage in the strata above the immediate roof material that is to be supported. Usually core-drill information is not readily available, but the character of the roof can be determined by traversing roof falls in and adjacent to the area where the use of roof suspension supports is contemplated. For efficiency and economy, the distance of the anchoring strata above the coal bed must be less than the thickness of the bed. This permits a choice of vertical or inclined holes, as conditions warrant, to obviate the use of jointed drill-steel and suspension rods. The suspension rods should be longer than is necessary to permit them to pass through any zone of soft material that may be encountered.

Equipment, Accessories, Selection of Materials, and Fabrication

This phase of a roof-suspension-support project especially involves the mine mechanical department upon which ordinarily devolves the responsibility of selecting the materials and equipment. To initiate and maintain a project, the equipment provided must be suitable and meet minimum requirements. The first requisite is suitable drilling equipment; it has been found that the pneumatic stoper drill is a satisfactory device, not only because of its drilling speed but also because it can be utilized as a hammer to tighten a suspension rod on its wedge at the back of the drill hole. Obviously the use of pneumatic tools requires an air compressor, which should be small, rugged, and capable of operating over long periods without excessive heating. A compressor should supply to 150 cubic feet of air per minute to a stoper drill at a pressure of 100 to 120 pounds per square inch. For efficiency and economy, the compressor and stoper drill can be supported on a self-propelled mobile unit, the design of which will differ for track or trackless mining operations. A pneumatic impact wrench is a very efficient device for applying a uniform tightening force to the nuts that are attached to the threaded ends of the rods.

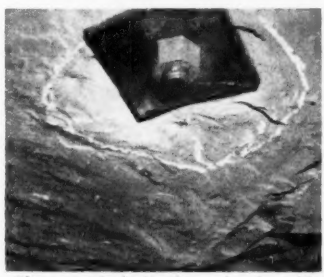
The type of suspension support in general use today varies according to the structure of the roof strata and may consist of a channel beam with a number of suspension bolts (rods), or a single belt with a steel washer commonly called a "shin plaster." The steel washer or a channel beam serves as a bearing plate for one or more nuts against the exposed roof. Suspension rods, channel beams, and "shin plasters" are made from ordinary hot-rolled mild steel. Standard 4-inch channels, 6.25 pounds per foot and 12 feet long, are commonly used. The "shin plaster" or washers are $\frac{3}{8}$ inch thick and 1 foot square or triangular, of about the same bearing area. Discarded tie plates sometimes are used for this purpose. The bolts most commonly used are 1-inch diameter; one end of each is threaded a distance of 5 inches, whereas the other end is slotted, 6 inches long by $\frac{1}{8}$ inch wide to permit insertion of the anchorage wedge. A wedge is generally 1 inch wide, 6 inches long and $\frac{3}{8}$ to 1 inch thick at the back depending on the diameter of the drill hole and the composition of the rock at the point of anchorage. Standard 1-inch hexagonal nuts are satisfactory for tightening the bearing plates against the roof. Angle washers for use on the ends of inclined rods are made from 3" x $\frac{3}{8}$" flat bar or 3" x 3" x $\frac{3}{8}$" angle iron.

Channel beams are attached to the roof with 4 or 5 suspension rods whereas with the single bolt method a "shin plaster" is supplied for each bolt. The number and the length of the rods necessary to attach a channel beam and the size of the wedges should be determined at the time the roof is investigated and should be changed only after very careful consideration. The thread of each rod should be well cut, or rolled to permit easy attachment of the nut. The slots should be clean but not smooth to permit good wedging. The holes in the channels, washers and slots and the wedges can be made with a torch, using a No. 2 tip. Some repair shops at mines are equipped to cut a 6-inch slot in a 1-inch rod in 30 seconds and make four 1-by 1-by 6-inch wedges in a minute after the metal is heated. Eighteen 1-inch wedges can be made from 12 inches of bar stock with a minimum of waste.

Installation of Supports

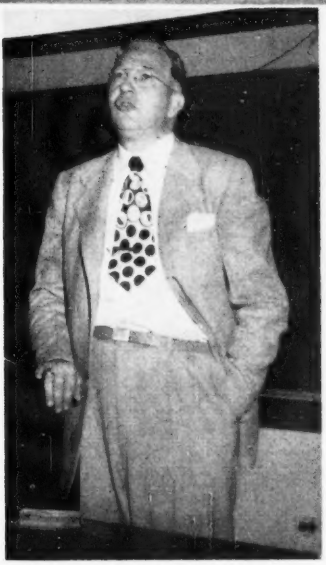
When the use of suspension supports in a mine is deemed advisable,

(Continued on page 29)



Close-up of pin in place, showing shin plaster wedged against roof.

Visitor's attending "Miner's Day" at Pennsylvania State College.



Mr. R. A. Brenholtz, Training Superintendent, Lukens Steel Company, addressing a group of visitors at the "Miner's Day."

Second Annual Coal Miners Day At The Pennsylvania State College

Coal Mining extension course graduates of this year, who studied under the supervision of instructors from the Pennsylvania State College, visited the college on May 14th to get better acquainted with what the school is doing for the coal mining industry in education and research. Following was the program for the day:

8:30-10:30 Registration in the lobby of the Mineral Industries Building

9:00-10:45 Conducted tour of the Mineral Industries Building (10 minutes in each station)

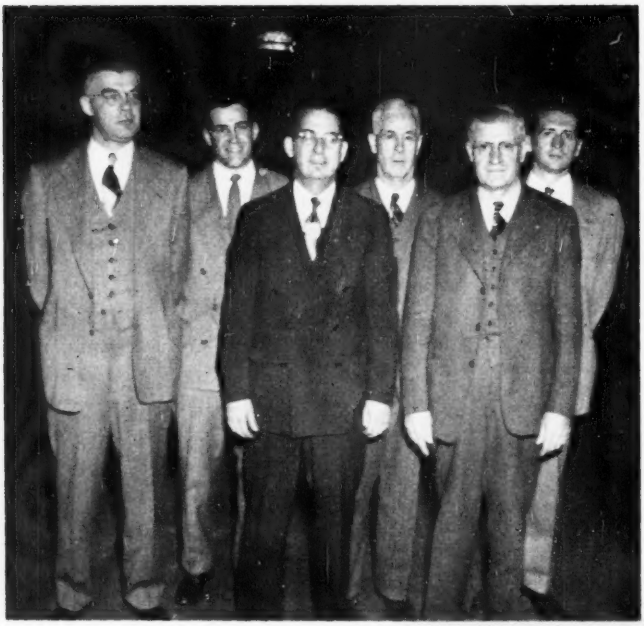
1. Fluorescent Mineral Display—Lobby
2. Mining Ventilation Laboratory—Room 24
3. Mineralogy Laboratory — The Electron Microscope—Room 20
4. Mineral Preparation Laboratory Room 5

A new Mineral Science Building at Pennsylvania State College.

Night-school graduates listening to speech by Mr. Brenholtz at the "Miner's Day."

Demonstrating Mine Rescue equipment in night class at Green County, Pennsylvania, chapter.

Students attending night class at Green County, Pennsylvania.



5. Plastic Relief Maps—Room 104
6. Secondary Recovery of Oil—Core Studies—Room 203
7. Metallography Laboratory — Room 202
8. Ceramics Laboratory - Enameling—Room 227
9. Weather Station—Room 313
10. Mine Safety Equipment & Safety Lamps—3rd Floor Halls

All Tours Must End at 10:45 *A.M.*

10:45 — *Group Picture (Front of Mineral Industries Building)*

11:00-12:10 — Meeting in Room 121, Sparks Building.
Introduction of College Officials
D. C. Jones, Director, Mineral

Front Row (left to right): Carl Peterson, Asst. to V. P. Northwest Mining and Exchange Co. Arnold Lamm, Sunnyhill, Francis E. Schroyer, Mine Inspector, 4th Bituminous District.

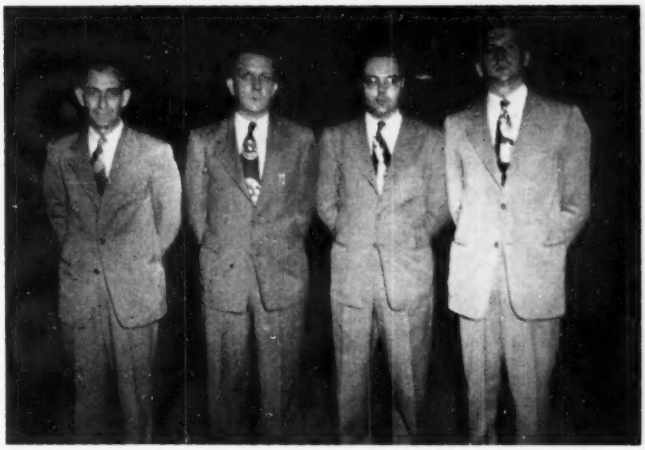
Back row (left to right): Sheldon Jones, Sales Engr., Socony Vacuum Oil, Al Nairn, Mine Inspector, 12th Bituminous District, Fred Axelson, School of Mining Industries, Penn State College.

Graduated students watching motion pictures of the Colmol at the DuBois, Pennsylvania, in graduation exercises.

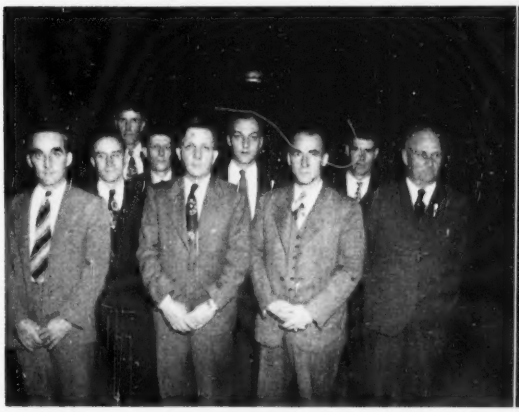
Industries Extension Services
Greetings from College Officials:
J. Orvis Keller, Assistant to the President, in charge of Extension
Edward Steidle, Dean of the School of Mineral Industries
Introduction of Resident Department Heads
Talk on Training in Industry
R. A. Brenholtz, Training Assistant, Lukens Steel Company, Coatesville, Pennsylvania
12:30-2:00 Luncheon at Autoport Restaurant
2:00 Visitation to other parts of the Campus, Athletic Events, Etc.

ATHLETIC EVENTS

1:00 Track Meet with Michigan State, New Beaver Field
2:30 Baseball with Pittsburgh, New Beaver Field



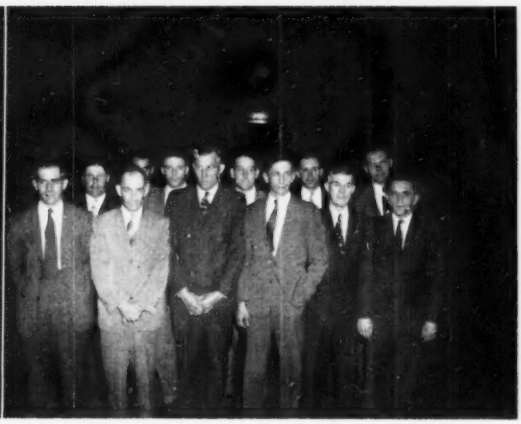
Class Instructors—Left to right—Bob Boyer, Curwensville Class, E. A. Amon, Shawville Class, Dud. Doughman, Brockway Class, Fred Axelson, Penn State.



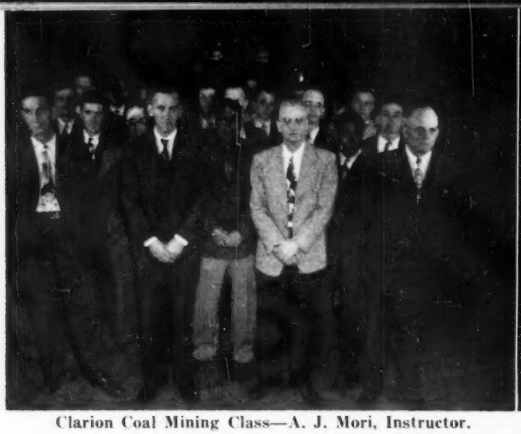
Shawville Class—E. A. Amon, Instructor.

Glen Richey Class—Walter Briggs, Instructor.

Brockway Class—Dudley Doughman, Instructor.



Curwensville Class—Bob Boyer, Instructor.



Clarion Coal Mining Class—A. J. Mori, Instructor.

Visitors.

Bituminous Coal Operators Golf Party

The Bituminous Coal Operators Golf Association of Western Pennsylvania held its 2nd golf party of this season at the Uniontown Country Club on Thursday, June 9. This party was much larger than the last one of the season, held at the Nemacolin Country Club.

These parties appear to be getting

Jim Hamilton, left, Manager of Mines, Republic Steel Company, and Henry C. Rose, right, Vice-President of Operations, Pittsburgh Consolidated Coal Company, at the speakers table.

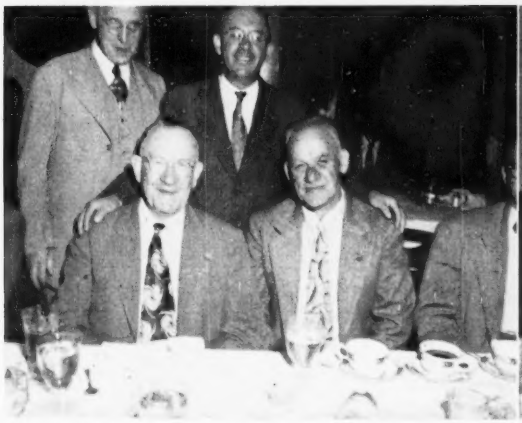
W. G. Stevenson, left, General Manager, Hillman Coal & Coke Company, and Francis McQuillen, right, Ass't to the President, West Penn Power Company, conversing at the dinner table.

George S. Struble, left, State Mine Inspector, and George Rigg, General Manager of Mines, Weirton Steel Corporation.

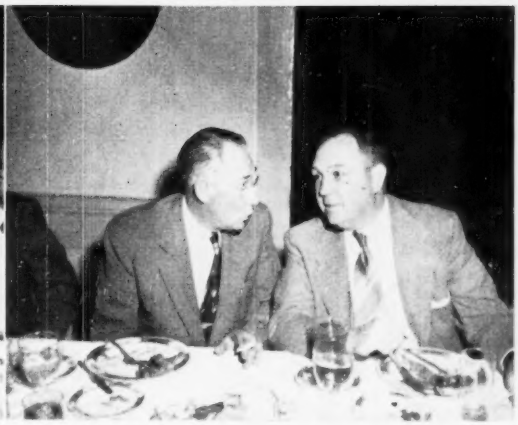
J. V. McKemma, left, State Mine Inspector, and C. M. Donahue, right, Mining Sales Mgr., Mine Safety Appliance Co.

jollier: at the same time, the consumption of the so-called refreshments is becoming more moderate. Could this be because the boys are getting older.

A group of the attendants at the Country Club Bar after the dinner.



Left, sitting, W. A. McBride, President, Jefferson Coal & Coke Company, and Mark Simpson, right, of the Simpson Coal Company.

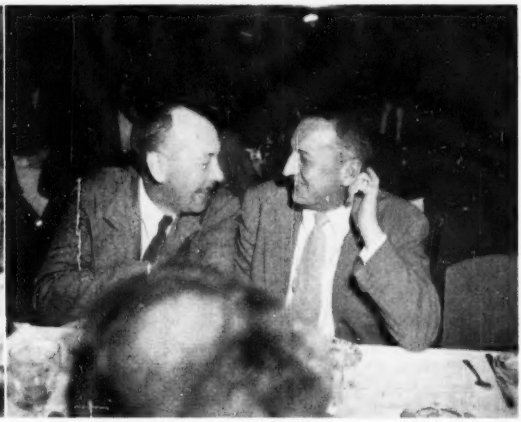


Jim Strickler, left, President of the Electric Manufacturing & Repair Company, and Allan Brooks, General Manager of Mines, Mather Colleries Company.

S. E. Gane, left, president, S. E. Gane Company, and J. A. Youkins, right, General Manager, Mining Division, Duquesne Light Company.

L. J. Schulte, left, Moseback Electric Supply Company, Pat Dillon, middle, Sales Manager for Heyl & Patterson, Inc., and Jack Connor, right, General Manager of Mines, West Penn Power Company.

Art Schoenberg, left, Sales Manager, Mining Division, Highway Equipment Company, and Edwin Lee, right, of the Lee-Norse Company.



Howard Miller, left, Chief Electrician, Crucible Fuel Company, and Elliott Williams, right, of the Hewit Rubber Company of Pittsburgh.

Mine Examination Questions & Answers

Q. 12. (a) Name the safety lamps approved by the Secretary of Mines.

(b) What is a permissible safety lamp?

(c) List the important precautions that should be taken when using a flame safety lamp.

A. 12. (a) (20 pts.) Wolf 4 types.

1. Wolf round wick (Aluminum)
2. Wolf flat wick (Aluminum)
3. Wold round wick (Brass)
4. Wolf flat wick (Brass)

Koehler 4 types

1. Koehler round wick (Aluminum)
2. Koehler flat wick (Aluminum)
3. Koehler round wick (Brass)
4. Koehler flat wick (Brass)

(b) (10 pts.) A permissible safety lamp is a lamp that is similar in all respects to the sample that has passed certain tests of the United States Bureau of Mines and used in accordance with the specifications as prescribed by the Bureau, and bears a permissible seal of approval of the United States Bureau of Mines.

(c) (30 pts.) 1. Be sure that the lamp is locked before taking it into the mine.

2. Examine it carefully yourself to see that it is in good condition, even though it has passed by the lamp inspector.

3. Do not carry a key or other device for unlocking the lamp.

4. When assembling the lamp see that all parts are in perfect condition and properly assembled.

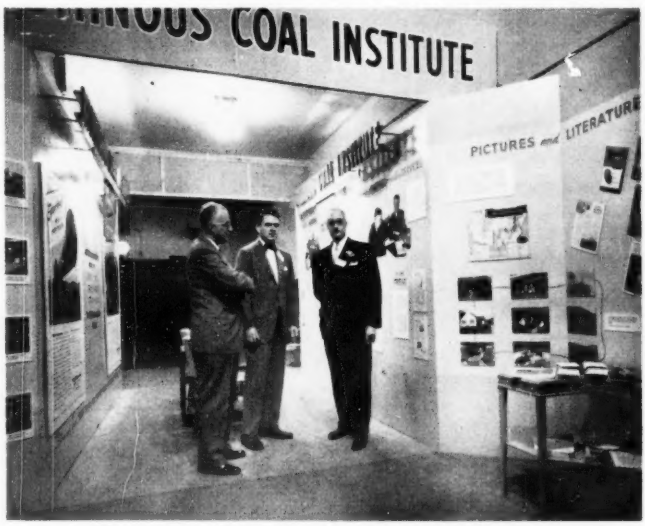
5. Do not carry matches into the mine.

6. Do not attempt to open a lamp within a mine unless at a regular lamp station where the rules of the mine permit lamps to be opened and relighted.

7. Do not set your lamp on the bottom of the mine; it may be accidentally upset and extinguished, and the glass globe may be broken. It is better to hang the lamp on a timber by means of a stout nail.

8. Do not use a lamp that has dirt or oil on the gauze.

9. Do not allow the flame to smoke; soot will fill the gauze and you will have a poor light.



Henry C. Woods (right), Chairman of the Board, Sahara Coal Co., Chicago, Ill., at the exhibit of the Bituminous Coal Institute during the recent coal show of the American Mining Congress, Cleveland, Ohio. With Mr. Woods are T. A. Day (left), member of the BCI public relations staff, and James H. Cunningham, Director of the BCI Speakers Bureau.

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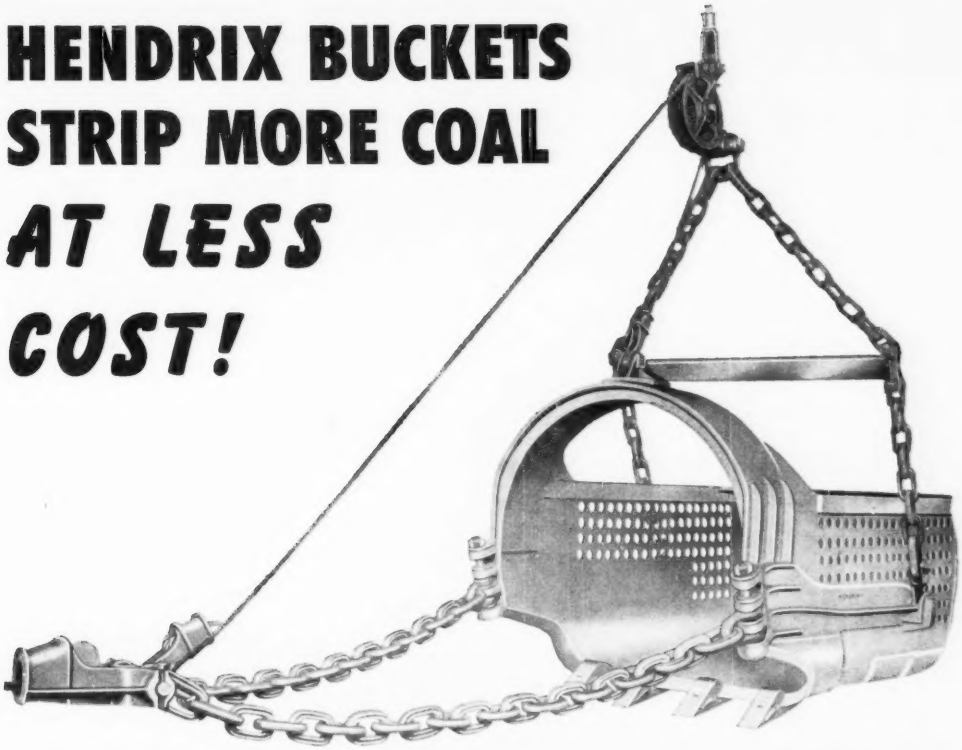

Eating up overburden at the rate of ¾ to 40 cubic yards a bite, the Hendrix Type HS Dragline Bucket (often referred to as "the coal stripper") gets down to the seam in a hurry! The "HS" is large in capacity, yet light in weight, but also rugged in construction, providing swift, smooth, precise operation that gets more work done in less time. The "HS" is armored with cast manganese steel runners and wearing plates and is equipped with renewable manganese steel shoes for runners and wearing plates. Those parts which wear the most can be replaced *right on the job*, thus saving time and resulting in more profits.

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- ★ 20% to 40% lighter than other buckets, type for type.
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- ★ Manganese steel chains, fittings, and reversible tooth points.
- ★ 12% cast manganese steel lips with tooth bases cast integrally.
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9. Long life automatic disc discharge valves.
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Drill your holes the easy way

Do You Shoot Boom Holes?

Do it the easy way

Do You Take Top?

Do it the easy way

How About Wire Hangar Holes?

One Man—The easy way

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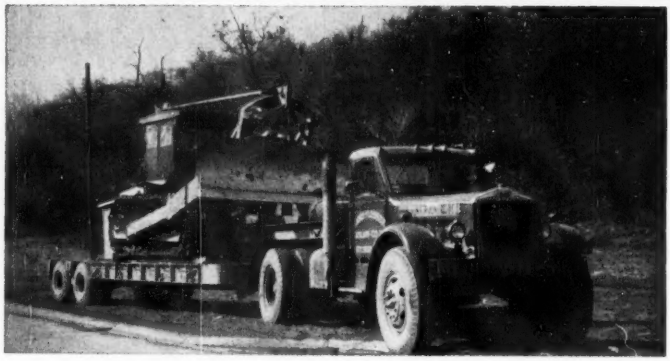

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Steubenville, Ohio, P. O. Box 547

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- Pumping machinery
- Lorries for coal and slate
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10. Before entering a room or a "tight end", examine the flame of your lamp, and as you advance make frequent tests for gas. Make frequent tests during the shift and always before and after each shot.

11. If possible, avoid testing for gas pockets while shots are being fired; the flame of your lamp may be driven through the gauze and gas outside the lamp may be ignited.

12. When the gas flames in your lamp, withdraw the lamp slowly and carefully, and if the flame goes out, retire to fresh air before attempting to relight it.

13. If your lamp flames and the wick flame goes out, be sure to examine the gauze, because the gas may be burning within the gauze. To put it out, shut off the air supply, or take the lamp to fresh air, if near at hand. Some miners smother it with their clothes, but if the gauze is red hot it may ignite the clothing and thus the gas.

14. Lamps that have not been used for some time often have rusty gauzes, a hardened wick, or gummy oil. Do not take a lamp in such a condition into a mine.

15. Having detected gas, do not repeatedly put your lamp into it, but arrange for the removal of the gas by ventilation.

Q. 13. (a) What is physical shock? What treatment would you give?

(b) What is arterial bleeding How would you control it?

(c) What is meant by the term "artificial respiration?"

(d) How would you administer artificial respiration?

(e) What first aid supplies are required by law to be kept at the mine?

A. 13. (a) (15 pts.) Physical shock is a state of collapse or prostration that interferes with the normal heart action, respiration, and circulation. Physical shock is a dangerous condition that should be given prompt attention and medical aid obtained as soon as possible.

Lower patient's head by placing a pad under the shoulders; cleanse the mouth of all foreign materials; keep patient warm by covering him with blankets and placing hot applications around his body; give patient aromatic spirits of ammonia, one teaspoon in half a glass of water, slowly by sips if the patient is conscious and, if unconscious, use inhalant stimulants, loosen all tight clothing; and rub extremities towards the heart.

(b) (15 pts.) The blood from the arteries comes direct from the heart and has the pulsating effect of the heart, which is forcing the blood throughout the body. When blood spurts from a wound and is bright red, an artery has been cut and this is arterial bleeding.

When an artery has been cut, pressure should be applied at the nearest available pressure point to control bleeding. Use digital pressure and apply tourniquet over pressure point between the wound and the heart. Apply sterile compress and bandage over the wound, and for additional pressure tie knots over wound, and for additional pressure tie knots over wound. Elevate the wounded part to retard the flow of blood, except wounds of the head and when shock is present, loosen tourniquet at frequent intervals and get patient to a doctor as soon as possible.

(c) (15 pts.) Artificial respiration is a method by which normal respiration is imitated by manual movements to restore breathing.

(d) (15 pts.) Prone pressure method: lay the patient on his belly, one arm extended directly over-head, the other bent at the elbow, and turn the head toward the extended arm so the side of the face will rest on the hand or forearm of the bent arm, and the nose and mouth will be free for breathing. Kneel, straddling the patient's thighs with your knees placed such a distance from the hipbones as will allow you to place the palms of the hands on the small of the back with the fingers resting on the ribs, the little finger just touching the lowest floating rib, the thumb and fingers in a natural position, and the tips of the fingers just out of sight on the sides of the trunk. If conditions make it impracticable for

An architects sketch of the Atlas Equipment Corporation property after completion of the new two story office building addition next to the street. The firm's officers and sales, accounting and clerical personnel have moved into the new quarters.

Atlas Equipment Corporation Occupies Enlarged Quarters

The officers and clerical personnel of Atlas Equipment Corporation, local distributors of heavy industrial, construction, coal stripping and materials handling equipment, are now occupying a new two-story building addition recently completed. The new addition provides executive offices, larger quarters for sales, accounting and clerical staffs and an assembly room for group meetings and conferences.

According to P. B. Reinhold, president, the space vacated in the older building will be used for increased service department facilities and special sales and service training courses which will be made available to customers' employees as well as Atlas personnel.

Founded in 1935, the Atlas Equipment Corporation was originally located in the Oliver Building here, and moved to its present site at 635 Ridge Avenue in 1945. The newly completed building addition was designed by Hoffman & Crumpton and constructed by W. F. Trimble.

Other officers of the firm are Lawrence B. Cummins, secretary and sales manager, and John L. Baird, vice president.

the operator to straddle both thighs, he may assume a position where but one thigh is straddled. With arms held straight, swing forward slowly, so that the weight of your body is gradually brought to bear upon the patient. The shoulders should be directly over the heel of the hands at the end of the forward swing. Do not bend the elbows. This operation should take about two seconds. Now, swing backward immediately to remove the pressure completely. After two seconds swing forward again. Thus, repeat deliberately 15 times a minute the double movement of compression and release, a complete respiration in four seconds. As soon as artificial respiration has been started and while it is being continued, an assistant should remove all foreign substances from his mouth and see that his tongue is in a position that will not interfere with his breathing and loosen any tight clothing about the patient's neck, chest, or waist. Keep the patient warm. Do not give any liquids whatever by mouth until the patient is fully conscious. To avoid strain on the heart when the patient revives, he should be kept lying down and not allowed to stand or sit up. If the doctor has not arrived by the time the patient has revived and is conscious, he should be given some stimulant, such as one teaspoon of aromatic spirits of ammonia in one half a glass of water or a hot drink of coffee or tea. The patient should be kept warm. Resuscitation should be carried on in a safe place nearest possible to that where the patient received his injuries. He should not be moved from this point until he is breathing normally of his own volition and then moved only in a lying position. Should it be necessary due to extreme weather or other conditions, to move a patient before he is breathing normally, resuscitation should be continued while he is being moved. A brief return of natural respiration is not a certain indication for stopping the resuscitation treatment. Not infrequently a patient, after a temporary recovery of respiration, stops breathing again. The patient must be watched; if natural breathing stops, artificial respiration should be resumed at once.

(e) (15 pts.) There shall be provided at all mines stretchers, water proof and woolen blankets, bandages, splints, and other medical supplies to render first aid and relief to employes, who may be injured. These supplies shall be kept in a suitable room. The room shall be located near the entrance to or inside of the mine, and shall be sufficiently large to accommodate the injured employes while they are receiving temporary medical attention, and said room shall be used exclusively for this purpose, and it shall be kept heated, or constantly supplied with apparatus for the heating thereof.

Q. 14 (a) If the quantity of air passing through the mine is 100,000 cubic feet per minute and the main return shows .5 of one percent methane, how much methane is being liberated per minute? In 24 hours?

(b) 1. If this gas was being liberated in one split in which a quantity of 30,000 cubic feet of air was measured on the return of the split, what would be the percentage of gas in this split?

2. Would this be considered a dangerous amount in the air current?

A. 14 (a) (20 pts.)

100,000x.005=500 cu. ft. per min.

60x24x500=720,000 cu. ft in 24 hours.

(2) (20 pts.)

$$1.\ \frac{\text{gas} \times 100}{\text{gas \& air}} \quad \text{or} \quad \frac{500 \times 100}{30{,}000} =$$

1.66 plus percent.

2. Yes.

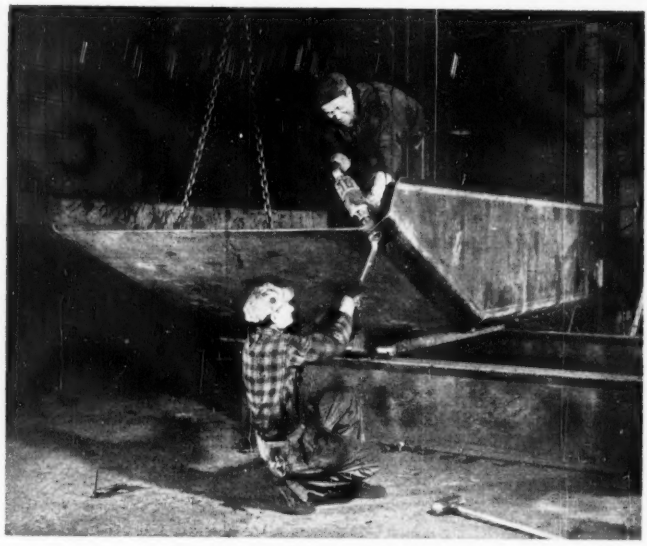
Catalog sections number 90-010, 90-020 and 90-030 by the Firth Sterling Steel & Carbide Corp., McKeesport, Penna., give detailed information and prices, as of May 1, on the Firthite Undercutter Bit, the Firthite Drill Bit and the Firthite Finger Bit.

Paul C. Major, of Mt. Lebanon, has been elected as vice president and assistant treasurer of the Penowa Coal Co., Inc., at a special stockholders' meeting held in the Grant Building offices of the company.

Leonard P. Sasso, also of Mt. Lebanon, was re-elected president and chairman of the board of directors. Other officers are John E. Anderson, assistant to the president; R. C. McKelvey, secretary and controller; W. M. Thomas, assistant secretary and assistant treasurer; and C. E. Swartzwelder, assistant treasurer.

Mr. Major, the new member of the firm's management, is a certified public accountant and was formerly associated with Price, Waterhouse & Co.

The Penowa Coal Co. operates mining activities in Allegheny and Washington Counties, Pa., and Brooke County, W. Va.



Here sideplates of ½-inch J & L Otiscoloy are being assembled with the ⅝-inch rear chute plate of a quarry-type truck body under production at the Euclid Road Machinery Company, Cleveland, Ohio. The bottom plate will be built up into a double bottom with 1½-inch oak planking between two ½-inch plates, to cushion loading impact. The sides of the body are flared to facilitate loading and reduce spillage. The smooth body interior and tapered chute contribute to fast, clean dumping. This design requires cold-forming high-strength steel. The plates here have been bent to shape on a brake press without loss of strength.

Airview Building KK, Caterpillar Tractor Co., Peoria, Illinois.

Rough Stores area. This bay is 100 ft. wide and 1040 ft. long. Building KK.

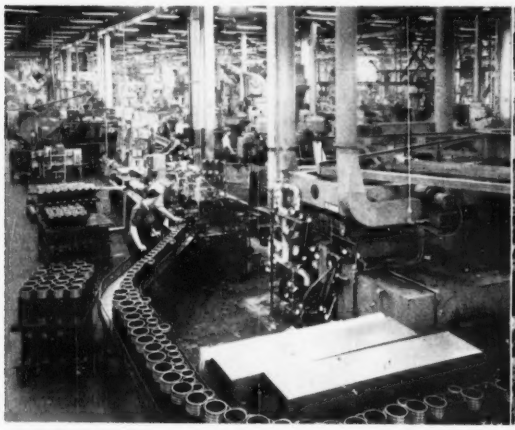
Caterpillar Tractor Ads Production Facilities

Caterpillar Tractor Co., Peoria, Illinois, has dedicated, and geared for full production its new Diesel Engine Factory, the most modern production site in the entire industry.

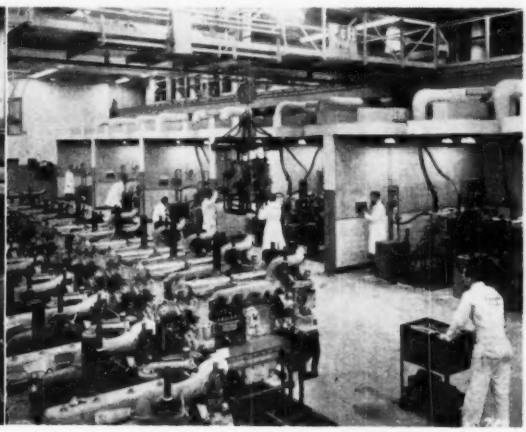
With an area of 925,000 sq. ft., contained within its rectangle, the factory represents four and one-half years of planning to convert from the planning boards a plant engineered for a specific operation, rather than a conversion of an operation to a specific type of building.

The building, from its conception, was designed, erected and equipped expressly for the economic manufacture of the Company's line of Diesel Engines. Designated as Building KK in the extensive expansion of Caterpillar manufacturing facilities, the structure houses facilities to produce all of the Diesel Engines, merchandized as industrial power units, marine engines and electric sets, in the company's line.

From the time the big earthmoving rigs bit into the land along the Illinois River and removed and filled some 202,500 cu. yds. of dirt for the original foundation site, the company "pictured in its mind just what was wanted" and built the building around the design so that machining, testing, shipping and other related engine work has been accomplished under one roof. The factory measures 1,120 ft. long in an east-west direction and 757 ft. in north-south width. Its subsequent value is recorded in the time and labor saved by proximity of adequate casting storage yard, adequate rough storage area inside the building, numerous conveyors to move rough material from storage to the machine lines, proper width of aisles, an efficient industrial railroad layout and the movement of material through an open inspection area. Its suitable space for storage of finished parts, the efficient application of bridge



Cylinder liner line. Machine at right is a Bullard Dunn. Machines behind "H" column are honing machines. Bldg. KK.



Engine testing cells in Bldg. KK.

cranes, fork trucks and other related material control factors has given KK a flexible and efficient movement of materials and the last word in modern mass production.

A fitting example of the ingenuity and engineering that went into the company's production is the fact that one man on the engine assembly line may work on 19 different engine models moving on a conveyor line.

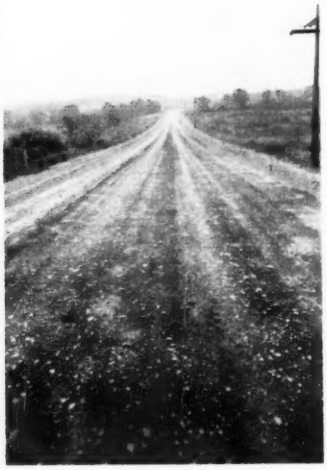
The assembly area consists of three assembly lines for basic engines, two for erection, testing, painting and shipping of industrial engines, a test room and large areas for the storage of finished parts, both purchased finished and machine shop finished. All three basic engine assembly lines, running parallel, end in the same bay, where a bridge crane is used to remove the engines to a set of gravity roller conveyors along which they are moved by a drag chain into the test room and stored pending test.

The Diesel Engine Factory is the first major milestone in Caterpillars post-war expansion program. Devoted exclusively to the manufacture of Diesel engines to power the company's Diesel track-type and wheel-type tractors and Diesel motor graders and to serve as well as sationary power units the building permits integration of manufacturing processes and the expansion of facilities in older areas of the Peoria plant.

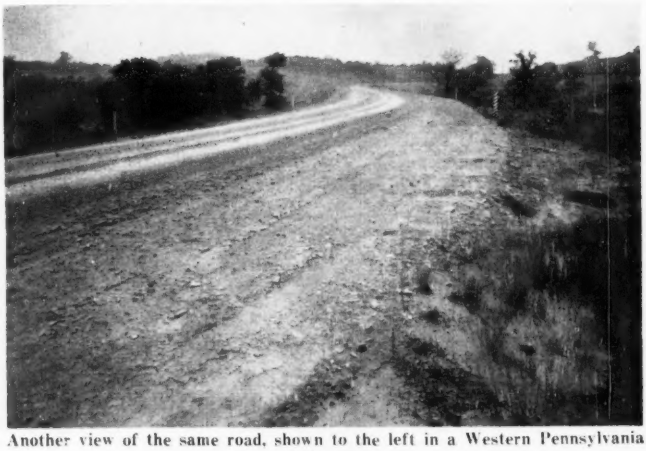
—— Please say you saw it in Coal Mining ——

Planted spoil bank at a large strip mine in Washington County, Pennsylvania.

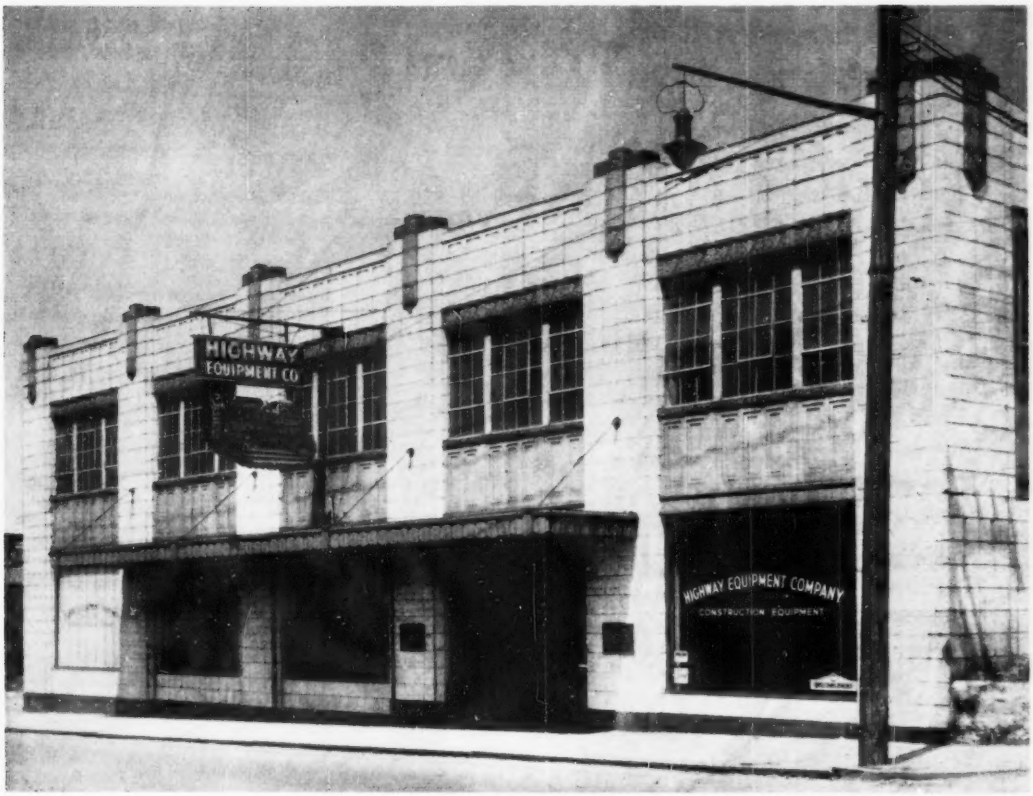
Reclaimed strip area near Washington, Pennsylvania.



View of a well-kept strip mine haulage road in Western Pennsylvania.



Another view of the same road, shown to the left in a Western Pennsylvania strip mine.

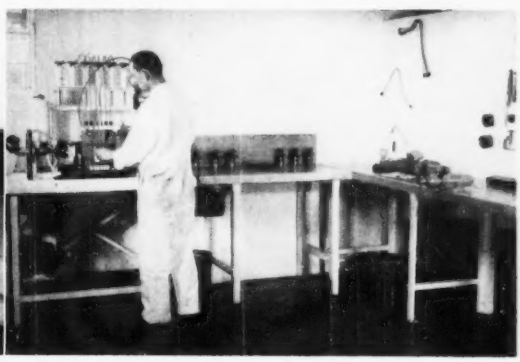


Highway Equipment Co. headquarters, 6165 Hamilton Ave., Pittsburgh, Pa.

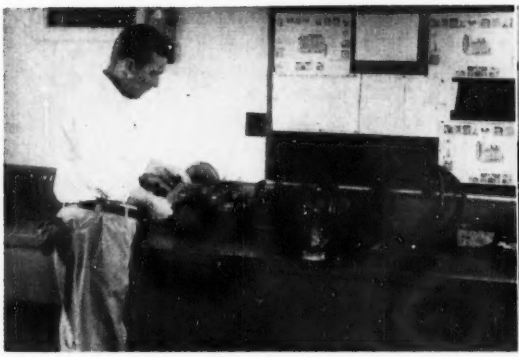
New Diesel Engine Service By Highway Equipment Co.

The Highway Equipment Company of Pittsburgh, Pennsylvania, has just completed a new building for servicing Diesel engines for its customers in the area that it serves.

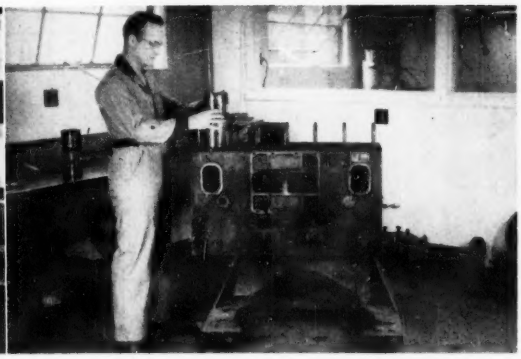
Injection Room—Checking General Motors Diesels Injector Pressure.



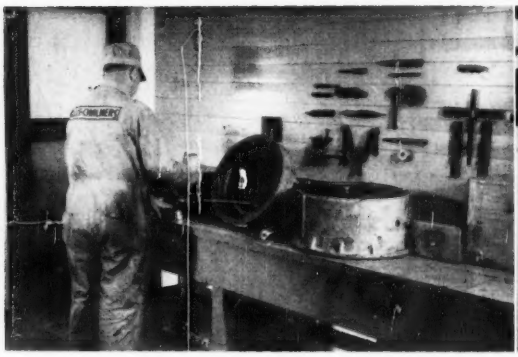
Injection Room—Repairing International Engine Injection Pump.



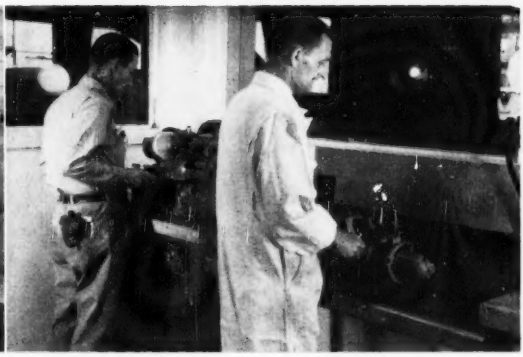
Engine Room—Mic-ing General Motors Diesel Engine Crankshaft.



Engine Room—Installing New Sleeves in Motor.

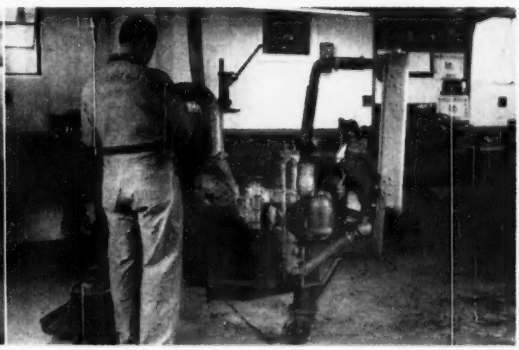


Engine Room—Overhauling Torque Converter for HD-19 Allis-Chalmers Tractor.



Engine Room—Refacing Valves.

Engine Room—Reseating Valves in General Motors Diesel Head.



Engine Room—Testing General Motors Diesel Engine.

ROOF SUSPENSION SUPPORTS

(Continued from page 16)

plans should be made to coordinate the installation with the normal mining cycle, thus avoiding unnecessary interference with production. The suspension supports should be installed before the coal is cut and as near to the face as possible. Roof suspension supports should be considered as permanent roof supports; and, although they may require more time to install in face regions than conventional temporary timber sets, nevertheless the reports of several coal companies state that the time of installation is less than one-third of that required for permanent conventional timbering and the total cost is less than half the cost of the supports formerly used.

Drilling Operations and Wedging of Suspension Rods

Workmen who drill the holes for suspension rods should know the importance of drilling the holes according to a predetermined pattern. The holes should be clean without irregularities, of a fixed diameter, and should terminate at an exact depth. Precise drilling is a prerequisite to satisfactory anchorage of the suspension rods. A drill operator should carefully observe the movement of his drill and the "cuttings" to determine whether a borehole terminates in a substance suitable for anchorage and the length of rod or thickness of wedge. Each member of a drill crew, usually consisting of three men, should familiarize himself with the details of drilling and applications of suspension supports to eliminate wasteful or unnecessary motions. Two members of the crew handle the drill while the third member is kept busy assembling rods and attending to other details of the operation. At a typical operation in the Pittsburgh coal bed, a stoper drill is used; it can drill about 2½ feet a minute in the roof strata and has a 24-inch pneumatic feed, which will permit drill changes in 18-inch stages. A minimum of four drill changes will accommodate the 5½ foot suspension rods that are used. This, however, varies with the thickness of the coal bed; consequently, the drill steel must be "tailored" for each job. When a drill steel (bit) is removed from a borehole, it should be stood on its cutting face or otherwise protected to prevent drill cuttings or other fine substances from entering the oiled shank end, thus clogging the bit. Drill steels, 7/8-inch in diameter, have proved to be satisfactory at the mine referred to in the foregoing. The gauges of the bits are such that the diameter of each drill hole is 1⅛ inches at the mouth and 1⅛ inches at the bottom. It was found through experimentation that, for satisfactory wedging, the holes should be 1¼ inches shorter than vertically installed rods and 2 inches shorter than rods installed at an inclination with the vertical. When channel beams are used as bearing plates they are shaped to conform with the irregularities of the roof and are held in place against the roof with screw jacks during the drilling of holes, which is accomplished through the slots in the web of each channel. Particularly with vertical holes, adjacent channel should be so set that the holes will be staggered to avoid drilling in a straight line and developing planes of weakness similar to driving nails into the grain line of

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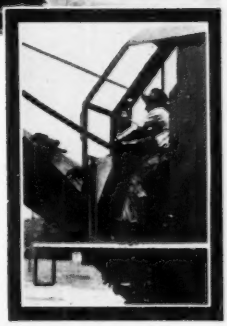

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a wooden board. When a hole is completed, a rod (bolt) with an angle washer and nut attached to the threaded end and the point of a wedge in the slotted end, is inserted in the hole. The rod then is tightened on the wedge with a tool-steel "dolly bar," $1\frac{1}{2}$ inches in diameter and 12 inches long, in the chuck of the stoper after which the stoper is operated for about one minute under full pressure thus driving the slotted end of the rod on the wedge to refusal. A pneumatic impact wrench then is used to tighten the nuts equally. Seven inches of one end of a "dolly bar" is machined to a 7/8-inch diameter and in the other end a recess is drilled $1\frac{1}{8}$ inches in diameter and $\frac{3}{4}$ inch deep to fit over the end of the suspension rods. Fatigue of metal develops quite rapidly in a "dolly bar;" therefore, extra bars should b available to avoid delays or incompleted work, which could result in undue exposure of the immediate roof.

Advantages of Suspension Roof Support Method

1. The method provides systematic supports at the working faces and protects mining-machine men, drillers, shot firers, and loading-machine men without the use of easily dislodged posts or cross bars.

2. Roof suspension supports, when properly installed, cannot be dislodged by blasting or mobile equipment; in fact, they are difficult to remove unless a cutting torch is used. A break-down of roof-fall accident statistics reported by the Bureau of Mines for 1946 shows that 14 fatal and 138 nonfatal accidents were attributed directly to the unintentional dislodgment of timber.

3. Ventilation usually is benefited because of decreased resistance to air flow through mine passageways; moreover, the "tight" side of line brattice can be kept free from obstruction by vertical posts.

4. Side clearance is improved through the elimination of vertical posts or legs and the storing of timber supplies, often on the clearance side, is eliminated. In addition, overhead clearance is improved. The 1946 record of causes of accidents in coal mines shows 32 fatal and 1,689 nonfatal haulage accidents resulting from persons being squeezed between moving equipment and ribs, timber, or roof.

5. Housekeeping in general is improved and storage space for material is reduced. Trolley and feeder lines, trailing cables, water lines, and brattice cloth can be supported on specially designed brackets attached to the suspension bolt ends.

6. A loading machine can clean up a cut of coal from rib to rib in less time than where timber legs interfere.

7. Mobile equipment such as shuttle cars can move faster with greater safety.

8. Usually there is a saving in the installation costs when suspension supports are used, especially with replacements of conventional wooden or steel beams.

9. The supplies used are less bulky than with conventional timbering; therefore, handling and transportation charges are less and the likelihood of injury to workmen is reduced.

10. Roof suspension supports can be considered permanent because replacements are not anticipated during the life of the area in which they are installed. It is reasonable to assume that deterioration of the units will be negligible because most of the rods are protected from the weathering effect of the mine atmosphere. Steel beams that have been exposed to the mine atmosphere for long periods ordinarily show little deterioration.

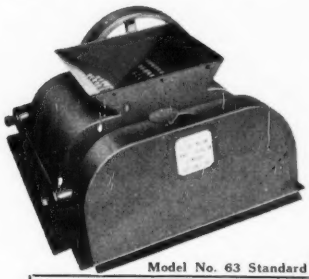
Conclusion

It is hoped that the foregoing statements do not give the impression that changing from conventional to suspension supports in a mine as a simple matter and that the change-over will result in a foolproof system. Several innovations or variations of the roof suspension method have been tried, some show a measure of success whereas others have failed owing to a misunderstanding of the

(Continued on page 33)

✓ the proven FACTS!

SCOTTDALE
double-roll
COAL
CRUSHERS



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IT'S A FACT the Scottdale Double Roll Coal Crusher produces a more uniform product and cuts power costs.

This is due to the efficient shredding action of the toothed double rolls which are assembled in a staggered position . . . this Scottdale exclusive feature is your assurance of consistent product uniformity.

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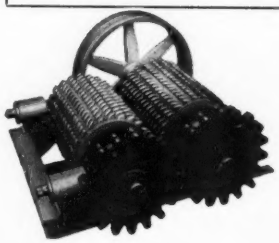


SCOTTDALE
MACHINE, FOUNDRY & CONSTRUCTION CO.
Box 51 Scottdale, Pa. Dept. MC.

Mobile Drilling, Inc. of Indianapolis has developed, and is now marketing a new, low cost Prospecting Drill which may be used on a Jeep, a truck, a crawler or rubber tired tractor. The new drill utilizes the power take-off on standard equipment and has the further advantage of operating in vertical or horizontal position.

It's low over-all height, 7'-4", and it's ability to be moved while in boring position means that it is ready to go to work the moment the equipment stops. In addition it requires only a one man crew. Operators who have been using the drill for the past eighteen months have found that drilling can be done with untrained men which has not been the case with other types of equipment.

The power head is driven by a Diamond roller chain and is completely enclosed. Mechani-sealed and self aligning ball bearings are used throughout. The tower is of sturdy steel construction, weighing only 558 pounds, for cross country travel.

The versatility is one of its biggest features. It may be used for prospecting for coal, oil, minerals, sand, gravl and clay, seismograph, horizontal or vertical blast hole drilling, shooting coal in strip pits preparatory to loading or shooting overburden, fence post, guardrail or sign board installation, soil testing, shallow well drilling, tree planting, cathodic protection of pipe lines, prefabricated house foundations and many others. It drills to depths of 100' depending on the hole size and application.

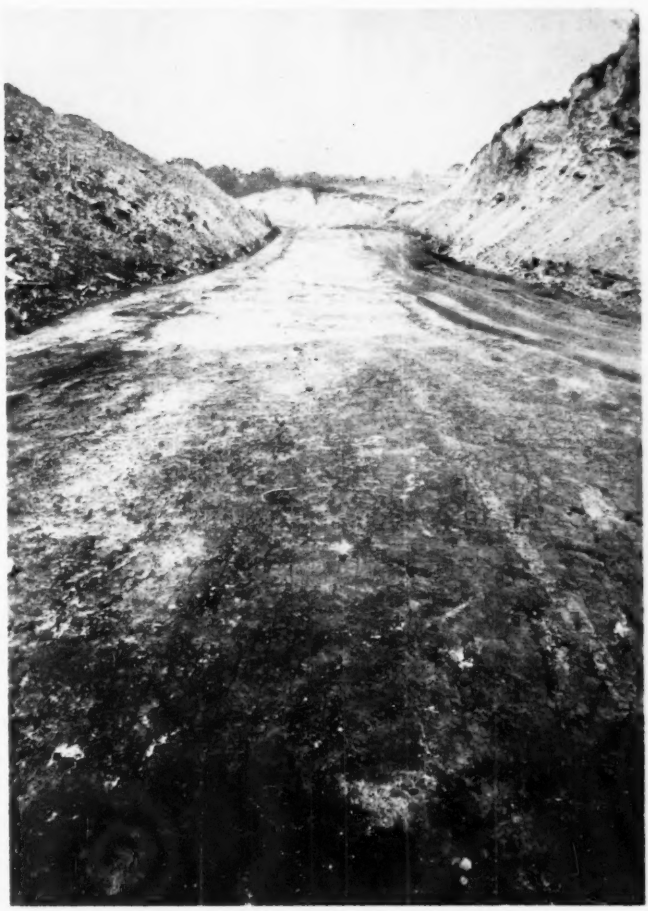
Users have said the Mobile Drill increases the number of holes per day at a substantial per foot cost. A typical Drilling Log of the Blackfoot Coal Company during the bad weather of January and February substantiates this claim.

The standard model sells for $995, will drill from 1⅝" holes up to 6" holes. Models drilling up to 48" holes will be available on special order. Standard models are equipped for hand feed. Hydraulic feed can be furnished at a slightly higher price.

When Jeep mounted, the auger may be operated at from 25 RPM to 400 RPM . . . and this mounting means that the Mobile Drill can go any place a rugged Jeep can go, over the roughest terrain, under most bridges and into the usually inaccessible places. The only time it is necessary to dismantle the drill is when the mobile equipment is required for another job. Dismounting is only a matter of minutes. Change over from vertical to horizontal position can be done by two men in fifteen minutes.

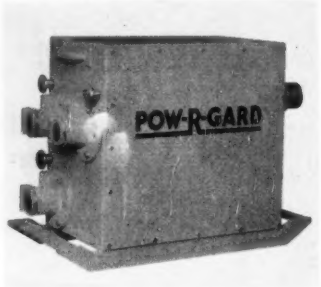
DRILLING LOG FROM EVERETT BOTTOM

Date	Holes Drilled	Total Footage	Location	Remarks
Jan. 7, 1949	8	206	Blackfoot Coal Co., Indiana	Bad moving
13	6	170½	"	" "
14	8	225	"	" "
15	6	193	"	" "
20	8	233	"	" "
22	10	292	"	" "
26	3	147	"	" " deep holes
28	7	213	"	" "
29	6	172	"	" "



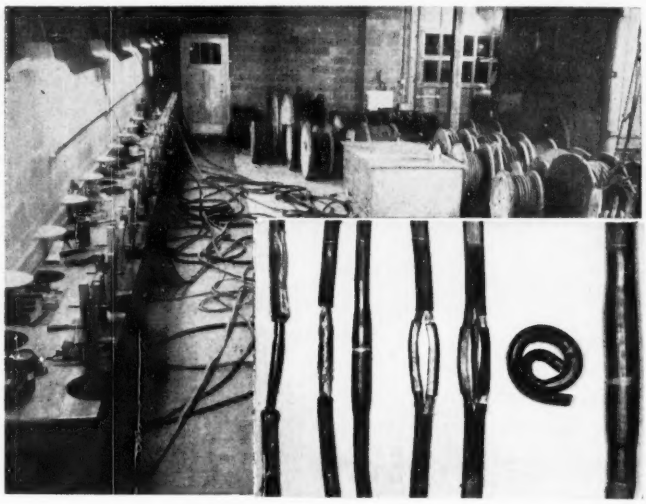
Cleaned Strip Coal at Washington County, Pa. Mine.

POW-R-GARD and GROUND-GARD are trade names describing and distinguishing two new, portable mine electrical power distribution systems, either A.C. or D.C. They combine circuit breakers, for automatic, rapid circuit interruption when any of the electrical faults common to mining occur, and service proven Anderson plugs and receptacles for system connection or extension, enclosed in dust-tight steel or explosion resistant cast aluminum runner mounted boxes that are designed to withstand arduous operating conditions, and are dimensionally small for use in the lowest seams. The resulting combinations, tailored to individual requirements, furnish protection to men and equipment, plus production saving operating convenience, for the machine operator has full reset control, avoiding time delays common to circuits protected by methods requiring maintenance by electricians.



Outstanding among several features is the cost saving factor of design for use with 3 or 4 conductor portable cable, rather than special cables consisting of power and control wires. A major part of system installations costs are reduced and elimination of the small, easily damaged control wires contributes to longer cable operating life, with fewer service interruptions. Necessary cable maintenance, such as making up connections and splicing is simplified. Another feature, push-pull circuit breaker operating handles, are less subject to accidental operation and, mounted beside the power outlets they control, are easily identified. Both outlets and controls are mounted on box ends, to reduce opportunities for damage or operation by passing equipment.

The trade names distinguish degrees of protection. GROUND-GARD systems, for Non-Permissible operations, furnish protection against overloads, arcing grounds and short circuits, plus circuit interruption in



Electric cable subjected to severe bending requires a flexible splice. A Davidson patented vulcanized splice with neoprene coating will outlast two or three ordinary splices.

For quotations write to:

CYRIL DAVIDSON *Mine Cable Vulcanizing*

Night Phone 3594-W — Day Phone 3219

956 BRUCE STREET **WASHINGTON, PA.**

THE NEW

105 TRACTAIR!

Combines all the features of an efficient, mobile, 105 ft. compressor with the flexibility of a 35 H.P. wheel tractor—

It Pulls, Digs, Bores, Loads, Drills, Tows, Climbs, Plows, Sweeps

The most versatile tool in strip mining—A powerful compressor on a rugged wheel tractor.

ARROW SUPPLY CO.

3600-3615 LIBERTY AVENUE **PITTSBURGH (1) PA.**

Phone MUseum 1555-6-7

the event of ground faults that energize the safety ground wire systems. POW-R-GARD systems duplicate these basic safety features and add positive protection against the hazards of plug extraction under load. An additional advantage in the use of a POW-R-GARD system is that, due to its characteristics, it affords an inbuilt method of checking safety ground system efficiency without dismantling or using external, accessory equipment. It is available for Permissible or Non-Permissible use. Either system will increase production by furnishing greater, more rapid protection from electrical hazard. The POW-R-GARD, in Bureau of Mines approved Permissible enclosures, brings maximum safety into the worst danger zones of an industry whose operating field is inherently and unavoidably hazardous.

ROOF SUSPENSION

(*Continued from Page* 30)

principles involved. Each mine is an individual problem requiring specific study and consideration to determine the best materials and methods of application. At present the Bureau of Mines has assigned 10 field employees in coal districts throughout the United States to assist operating officials with roof control problems and, if requested, they will assist with the initial installations of suspension supports. Information concerning the services of these men can be obtained from district offices of the Bureau of Mines or from the College Park, Maryland, office.

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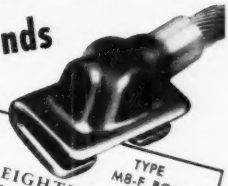
When TRACKING DOWN Excess Power Costs

Investigate MESCOWELD Rail Bonds

Faulty rail bonding is one of the most common causes of power losses in the mine. One of the first steps in perfecting your rail bonding systems is to install MESCOWELD Rail Bonds . . . for all MESCOWELD Rail Bonds have the cable attached to terminal by a patented flashwelding process to eliminate dead ends and assure perfect conductivity.



EIGHTEEN types of MESCOWELD Rail Bonds meet all bonding requirements. Immediate deliveries are made on all types. Write for details.

MOSEBACH ELECTRIC & SUPPLY COMPANY
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Drill Hard Ground

LIMESTONE
SANDSTONE
SHALE

FAST

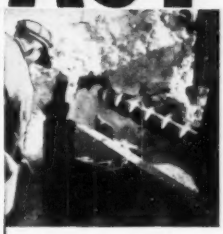
Kennametal Finger Bits provide greater speed, more shock and jolt absorbing power in hard ground. They give you the strength and durability in tough ground to keep your job on the move.

Kennametal Finger Bits are built with a cutting surface of solid Kennametal cemented carbide . . . that takes tough punishment, stays sharp longer, and saves money on bit changing cost on every job you do.

Drilled footage can be increased 50 per cent or more because you maintain a sharp cutting edge. Drilling costs are decreased because Kennametal is dependable . . . it helps you handle nearly every type of ground, keeps your job moving at a faster pace, and makes big gains in footage drilled.

Bits fit conventional drill heads. They are available in six standard sizes.

Folder FS-2 gives full particulars. Write for it today. Mining Division, Kennametal Inc., Latrobe, Pa.



"20 feet of tough, hard sandstone drilled per change of Kennametal Bits where drilling could not be done with any other rotary bit."
Butler Co., Pa.

KENNAMETAL

THE WORLD'S LARGEST MANUFACTURER OF CEMENTED CARBIDE MINING TOOLS

The New
S & A
FULL BEARING
DRAG LINE CHAIN
a "MUST" for Strippers

Made of alloyed steel, all links poured at one time from one heat of steel. A chain of uniform analysis and heat treatment. Strong and durable — low cost — quick delivery.

McClure Equipment Co.
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Now for the first time - Fast Lightweight strong and dependable

STAR
Aluminum Alloy Mine Roof Jacks
3 types of heads
3 types of bases
Various heights
Star Jack Co.
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CHICAGO 35, ILL.
Write for Literature

NEW RUBBER TIRED LOADER INTRODUCED BY THE CLARKSON COMPANY

A new rubber tired type 28 FA face loader — the only completely mobile face loader—has been announced by the Clarkson Manufacturing Company of Nashville, Illinois, manufacturers of the well known "Redbird" mechanical loaders.

Designed to permit more versatile loading operation, the new rubber tired loader introduces many construction and operational features for ease and efficiency of operation. Measuring only 42 inches high, 72 inches wide and 28 feet in length, it is mounted on two 12x20, 16 ply and two 9x20, 16 ply tires, offering extremely high road clearance—combined with short turning radius. One 50 H.P. motor operates the entire unit, with push-button controls conveniently located in one central unit. The front digging head has a maximum loading range of 130 inches, and by swinging the head and the chasis at the same time, operators can reach the corners as well as work in and around closer face timbers. The front head, on telescopic jacks, can raise and lower 26 inches above floor line and 18 inches below floor line.

Offering a capacity of 10 tons per minute, the new rubber tired loader contains the Clarkson "Redbird" Uniflight Conveyor Chain, with the rear conveyor including a special conveyor break that enables the operator to move the discharge conveyor into almost any position to meet high or low mine roof conditions. Both front and rear conveyors flex horizontally as well as vertically.

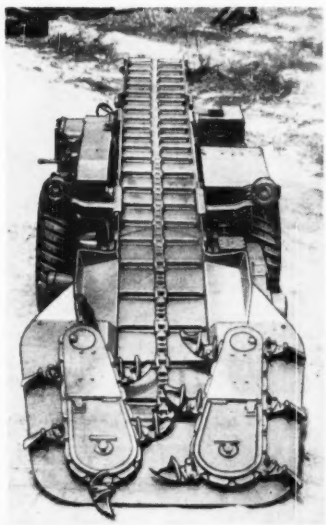
All parts of the new loader are easily accessible for repairs. Clutches are located on outside of main frame and have interchangeable parts. Forced feed lubrication has been included through all clutches and all main gear boxes.

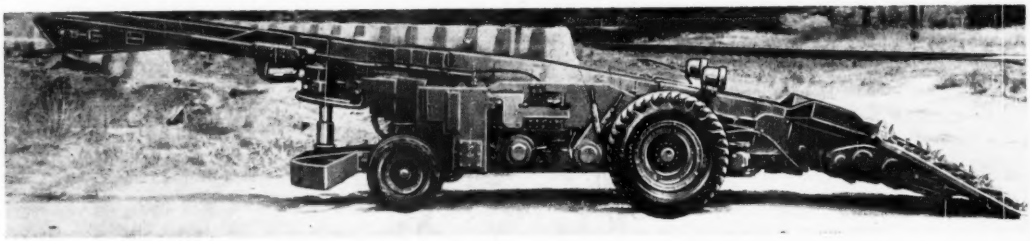
For complete information on the new Type 28 FA rubber-tired face loader, write to the Clarkson Manufacturing Co., Nashville, Illinois.

* * *

Issuance of a new technical information bulletin and data sheet on Chem-Rem, acid and alkali-resisting paint, is announced by Speco, Inc., Cleveland, Ohio.

The bulletin lists typical Chem-Rem applications and describes paint features in detail. Chem-Rem is a black industrial paint which withstands attacks of acetic and hydro-





chloridic acids, dilute sulphuric acids or mixtures of these acids. It protects against the severe action of bleaching solutions, dilute caustic soda, ammonia or other alkalines and is reputed to greatly increase the effective life of buildings and equipment.

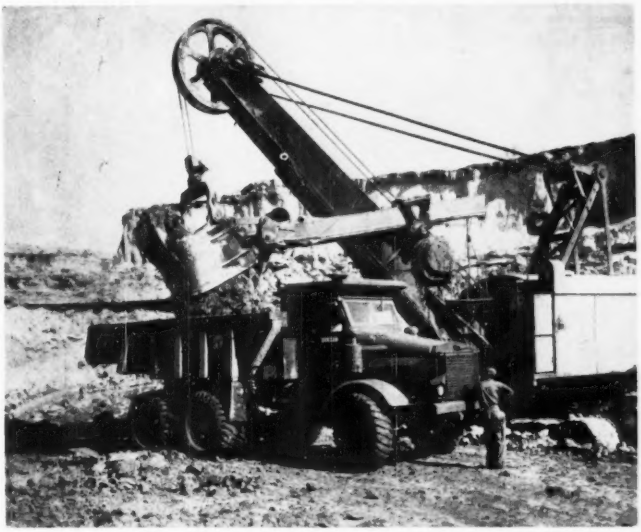
* * *

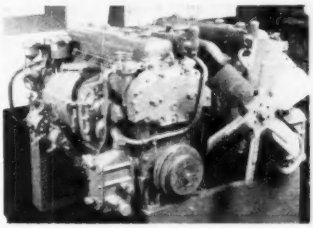
Quarry-type truck bodies are built to withstand the most rugged operating conditions a dump truck encounters.

Rock and gravel dropped into the loading, smash with severe impact against sideplates, front plate and rear slope plate. During off-the-road cross country hauling and dumping, the body is subject to fatigue and abrasive wear. Outdoor exposure, and continual wetting and drying which attends many quarry and mining operations, cause problems in corrosion resistance.

Jones & Laughlin Steel Corporation's high strength Otiscoloy steel is supplying many manufacturers with the most economical answer in this grueling application. For example. The Euclid Road Machinery Company, Cleveland, Ohio, builds many vital sections in quarry-type trucks and in other road machinery with Otiscoloy.

Every useless pound of deadweight is designed out of Euclid quarry-type bodies, in order to handle largest possible loads at high speed. Otiscoloy is used in body sections because it is twice as strong as mild steel, has 50 per cent greater fatigue resistance, up to six times greater resistance to atmospheric corrosion, and substantially greater abrasion resistance.





General Motors 6081 and 6082 Diesel engine-torque converter units which power the Euclid 1-FFD. Together these engines provide 380 hp and move 34 ton loads 25.4 miles per hour.

BOSTON WOVEN HOSE AND RUBBER COMPANY
TRADE MARK

ALL SIZES
of
CONVEYOR BELT
CARRIED IN STOCK!
in Pittsburgh.

HYDRAULIC HOSE
Suction & Discharge
Hose.

IMMEDIATE DELIVERY!

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JOHN BENKART & SONS CO.
Heavy Haulers and Riggers

INTERSTATE AUTHORITY: *Pennsylvania, Ohio, West Virginia, Maryland, Delaware, New York, New Jersey, Michigan.*

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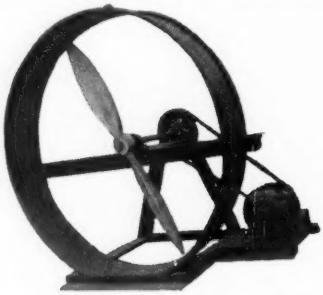
Dependable Service

2500 Charles Street, Pittsburgh (14) Pa. Phone Fairfax 8200

THEY BOOTED THIS ONE

Last months ad for Femco Trolleyphone startled many readers as much as seeing a confused football player carry the ball across his own goal line. The ad, prepared by Will Schoyer ad agency, made sense. But it was just the opposite sense from what Trolleyphones makers, Farmers Engineering & Manufacturing Co., of Pittsburgh, Pa., intended! One misplaced letter, overlooked in proofreading, made the ad announce that: Trolleyphones *boost* costs. Trolleyphones *boot* costs, it should have read—as the experience of hundreds of mine operators testifies! The Schoyer agency offers sincere apologies to the readers of COAL MINING for booting this one so accurately—in the wrong direction.



MINE FANS
3'— 8000 CFM
4'—12000 CFM
5'—20000 CFM

Light weight, high efficiency propeller fan complete with housing, shaft, bearings, etc. and driven by a suitable air cooled engine, AC or DC electric motor.

The Largest Stock of Electric Motors in Central Penna.

MEYER BROS. COMPANY
Main Office, Supply House & Shops—Philipsburg, Pa.

Strip Mine Blast Hole Drilling

Well prepared overburden in strip mining saves money.

Our trained blast hole drilling and blasting crews will properly drill and shoot most any type of overburden, in the quickest possible time, to give you more production at lower cost.

We operate in eastern Ohio, western Pennsylvania and northern West Virginia

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AND SERVICE PARTS

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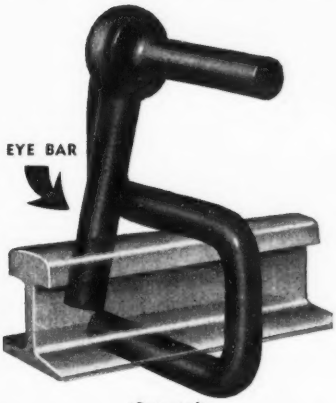
REDIPT

"S" CAR HOLD

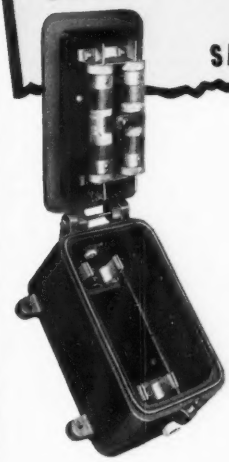


(Patented)

DUQUESNE MINE SUPPLY CO.

PITTSBURGH, PA.

FLOOD CITY FUSED LINE SWITCH ELIMINATES *Costly* SAFETY SWITCH PROBLEMS



RUBBER SEALED CASE...

The cast iron, RUBBER-SEALED case eliminates the hazards of coal dust and water seepage...yet is readily accessible. Unit is compact, only 12"x7"x4 3/4". Extra creepage insulation is provided by using 3/4" mounting panel and large clearances to ground.

THE FUSES ARE SWITCH BLADES

The fuses are the switch blades and are the only parts that should need replacing. Other features include; Spring brass fuse support that gives a snap-type break when opened—Copper supports hold blades in perfect alignment...Reinforced clips held permanently in line by grooved supports...Clamp type terminal in the center. One or two fuses may be used, capacities: 70-200 amps.

Also used as protective disconnecting switch for any motor in its range, or for feeder protection at night when trolley line switch is open.

FLOOD CITY BRASS & ELECTRIC CO.

JOHNSTOWN, PA.

Branch Office:

4 Virginia St. W., Charleston, W. Va.

VICTAULIC

The flexible coupling for all types of pipe.

Distributors

S. E. GANE & CO. 508 Grant St., Pittsburgh, Pa.

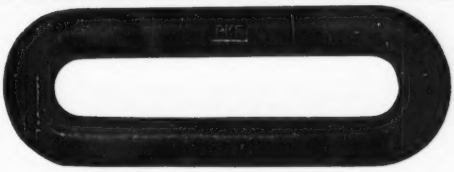
INCREASE YOUR PRODUCTION

with

DALY'S IMPROVED COMBINATION MINE CHECK

The Only Satisfactory Check on the Market Today

DALY TICKET CO., Collinsville, Ill.



"SUPERIOR" COUPLING LINKS

Drop Forged, Electric Welded, Fire Welded

A "Superior" line of Mine Car Couplings of all sizes—various types — All sizes, 7/8 in. & larger.

Shackles — Cutter Bits — Bit Steel

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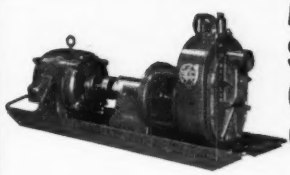
LEETONIA COST CUTTERS

Leetonia Hand Drills and Tools for use in and around mines are of proper shape and quality to enable either men paid by the day or on a tonnage basis to do more and better work with less effort.

Our 44-page mine tool catalog free upon request to mine operators, wholesalers and retailers.

We seek your Patronage. We suggest when you make your next purchase, you request your source of supply to furnish Leetonia Drills and Tools.

THE LEETONIA TOOL CO., LEETONIA OHIO



MARLOW SELF-PRIMING CENTRIFUGAL GATHERING PUMPS

Complete Line Carried in Pittsburgh Stock. Tel. HU 4400

HARRIS

PUMP AND SUPPLY COMPANY

HAMMOND'S BLASTING EQUIPMENT

WOOD TAMPING POLES FOR TAMPING EXPLOSIVE SHOTS: Poles are round made of hardwoods, lengths to 10 ft. Price per lineal ft. 1" dia. **6¢.**, 1⅛" dia. **9¢.**, 1¼" dia. **10¢.**, 1⅜" dia. **12¢.**, 1½" dia. **14¢.**, 1¾" dia. **20¢.** Special diameters and lengths can be furnished.

EXPLOSIVE BOXES: Made entirely of wood having no metal parts, tongue-grooved and dovetailed construction with automatic lock using a rubber band for a spring, treated with paraffin to make moisture resistant. "Approved by the Pennsylvania Department of Mines." Sizes as listed based on 1¼" x 8" sticks

No. 9 Powder Box	$ 2.05	Each	No. 50 Powder Box	$ 6.40	Each
No. 12 Powder Box	$ 2.40	"	No. 72 Powder Box	$ 7.50	"
No. 16 Powder Box	$ 2.85	"	No. 90 Powder Box	$ 8.40	"
No. 20 Powder Box	$ 3.10	"	No. 6 Cap Box (Sizes 2⅛" x 3" x 6" Inside)	$ 1.70	"
No. 25 Powder Box	$ 4.20	"	No. 8 Cap Box (Sizes 2" x 2⅛" x 8" Inside)	$ 1.70	"
No. 36 Powder Box	$ 5.30	"			

The above boxes are rigid and non-conductive.

J. V. Hammond Company — Spangler, Pennsylvania

SALEM "HERCULES" AUGERS FOR ELECTRIC DRILLS

Made To Withstand High Drilling Speed, Whip And Torsional Strain Of Electric Drills

Drills holes faster — Will not snap off shank or chip points. Outlasts four or five ordinary augers

THE SALEM TOOL COMPANY — SALEM, OHIO, U.S.A.

"WE LOOK INTO THE EARTH"

CORE DRILLING

- Coal Property Testing
- Pre-Grouting Mine Shafts
- Mine Drainage Bore Holes
- Large Diameter Holes for Ventilation & Escapeways

PENNSYLVANIA DRILLING CO.
PITTSBURGH 20, PA.

Let Us Solve your DRILLING PROBLEMS!

DIAMOND CORE DRILLING

BITUMINOUS COAL LANDS
TESTED . . . SATISFACTORY
CORES GUARANTEED

HOFFMAN BROS. DRILLING CO.
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AUTOMATIC COMPENSATORS
General Electric 5 to 15 H.P., 220 volt, 25 to 30 H.P., 440 volt, 36 to 42 H.P., 220 volt.
ROTARY CONVERTER
75 KW with transformers from 220 volt to 22000 volts.
GUYAN MACHINERY COMPANY
Logan, West Virginia

Strippers!

SEE **'CONTE'** FOR:

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- Power Control Units
- Water Pumps
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- Conveyors
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Used Equipment

1	35 BC Jeffrey Cutting Machine
4	35 A Jeffrey Cutting Machines
8	61 AM Jeffrey Conveyors (Head & Tail with 10 HP-DC Motors & Controls)
276	61 AM Jeffrey Conveyor Pans 5"-12" wide and 6' long.
3	61 AM Jeffrey Conveyor Pans ½ length
270	61 AM Jeffrey Conveyor Chains 12' long
4	61 HG Face Conveyors (Head & Tail with 5 HP-DC Motor & Controls)
21	61 HG Face Conveyor Pans 5' long & 15" wide
21	61 HG Face Conveyor Chains 10' long
2	61 EW Jeffrey Elevators (5 HP-DC Motors)
1	Brown-Fayro Car Spotting Hoist—5 HP
2	Acme Air Compressors—low type, 25 HP Motors
1	6 Ton Jeffrey MH-88 Locomotive
1	McGowan 3" Piston Pump, 5 HP Motor
1	Set MH-88 Jeffrey Locomotive Trucks, 6 Ton
1	Set Motor Trucks for 6 Ton G.E.

(Equipment is 250 V., D.C. 48" Guage Track)

Crystal Block Coal & Coke Co.
Sprigg, West Virginia

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2,000 tons of 60 lb. first class Relaying Rails at greatly reduced prices delivered your destination

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—— Please say you saw it in Coal Mining ——

RELAYING RAIL

Immediate Shipment
500 Tons 25 lb. ASCE
300 Tons 30 lb. ASCE
500 Tons 40 lb. ASCE
Standard Drillings and Lengths
Can be saw cut to special lengths if desired.

MIDWEST STEEL CORPORATION
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REBUILT EQUIPMENT - - - - READY TO SHIP

SPECIAL BARGAIN

3—Type A3G Goodman Duck bills.

COAL DRILLS

2—Jeffrey—250 v. DC.

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7—240 cfm Westinghouse 3 cyl. vert. 150 lb. pres. dir. con to 50 HP AC Slip ring or DC Motors.

MOTOR GENERATOR SETS—250 V. D.C. Motors 220/440 v. or 2200 v.—3 ph., 60 cy.

No.	KW	Make	RPM
3	250	Westinghouse	1200
1	200	Westinghouse	720
2	200	Westinghouse	1200
1	100	Westinghouse	700
1	100	General Electric	900
1	100	Westinghouse	600
1	100	General Electric	1800
1	100	Reliance	580
1	100	Delco	1200
2	90	Westinghouse	680
4	75	Westinghouse	720
1	75	Westinghouse	1200
1	60	Westinghouse	1200
1 NEW	50	General Electric	1800
3	40	Westinghouse	900
2	30	Westinghouse	720

125 V. DC M.G. Sets

1—100 kw. G.E. 125 v. 900 rpm. 220/440 v. 3 ph. 60 cy. AC Syn.
1—125 kw. G.E. 125 v. 1200 rpm. 220/440 v. 3 ph. 60 cy. AC.
1—75 kw. West. 125 v. 1200 rpm. 220/440 v. 3 ph. 60 cy.

D.C. Generators—250 v. D.C.

No	KW.	Make	Speed
1	250	West.	1200
1	175	G. E.	700
3 New	135	G. E.	1150
1	125	West.	560
1	125	Allis-Chal.	1150
1	110	West.	700
1	100	Allis-Chal.	1150
1	75	West.	750
1	40	G.E.	720

A.C. Generators—220/4000/440/220 v.

No.	KW.	Make	Speed
1	125	West.	257
1	450	Elec. Machy.	120

Pumps With A.C. or D.C. Motors

Qua.	Gpm.	Head	Kind	Make
3	1200	300	Cent.	Worthington
3	1100	323	Cent.	Worthington
3	1000	336	Cent.	Worthington

D.C. Motors—230 volts

No.	H.P.	Make	RPM	Type
1	175	G. E.	550	MD

SAVE OVER 50% ON NEW BLOWERS AND VENTILATING FANS

AXIAL FLOW VENT. FANS

1—4000 cfm 6x3" stat. pres. Sturtevant with 4/1.2 hp., 1750/1150 rpm., 220/3/60 motor.
2—4000 cmf 3" stat. pres. Sturtevant 2 speed AC Motors.
2—5000 cfm 1.8 stat. pres. Sturtevant 220/440 v. AC Motors.
31—6000 cfm Sturtevant Bul. No. 512389, 3" stat. pres., 7 blade dir. con. 5/1.5 hp. 1765/1175 rpm., 220/440 v. AC West. TEFC Motors.
2—6000 cfm Sturtevant 1.65" stat. pres. 220/440 v. AC Motors.
1—7500 cfm Clarage 7½ hp., 220/440 v. 2 speed motor.
2—12000 cfm 3" stat. pres. Sturtevant with dir. con. 10/3 HP. 1775/1180 rpm., 220/440 v. TEFC Motors.

HOISTS OR WINCHES

200—1½ ton Hand Cranked ratio 27:1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of ¼" cable, ratchet type brake, push button release.

CAR PULLERS

100—Brand New with ¼" cable, 1½ and 2 ton A.C. or D.C. Motors.

COMPRESSORS

1—315 CFM Ingersoll Rand Portable, 100 lbs. pres. driven by 105 HP Waukesha Oil Engines, 860 rpm.

BARGAIN — FOR SALE

100 KW. Diesel Engine Generator Sets

11—100 KW., 250/275 v. D.C. Delco Generators dir. con. to 150 H.P., Model GBD-8, 5½ x 7, 8 cyl. Superior Diesel Engines, electric starting with muffler, power panel and accessories.

Practically as good as new—
Only Used for spares.

DUQUESNE ELECTRIC & MANUFACTURING CO. - PHONE MONTROSE 5800 - PITTSBURGH, PA.

NEW AND REBUILT
STORAGE BATTERY LOCOMOTIVES
Any Size Any Track Gauge
Greensburg Machine Co.
Greensburg Pennsylvania

ADVERTISE YOUR USED OR SURPLUS EQUIPMENT IN THIS SECTION OF COAL MINING FOR QUICK SALE

WANTED

One 26" or 30" Mine Conveyor Belt, 1200 feet long, must be complete with belting, frame work, head and tail pieces. 250 volt DC drive motor and controls.
Write or contact Bradford Coal Company, Bigler, Pennsylvania, giving price, usage, etc.
BRADFORD COAL COMPANY
Bigler, Pennsylvania

CALL MOORHEAD

FOR REBUILT ELECTRICAL EQUIPMENT

LOCOMOTIVES

Haulage and Gathering Locomotives

20 Ton Jeff. and G.E. 500 v. 42" Ga. (Can be rewound 250 v.)
12 Ton West. 250 v. 36 or 44" Ga.
8 Ton Goodman 500 v. 42/44" Ga. (Can be rewound 250 v.)
6 Ton West. 250 v. 904 Motors 36" Ga.
2-4 Ton Goodman 42" Ga. 250 v. with reel.

SLOPE AND SHAFT HOISTS

50 HP Heyl Patterson sgl. fixed drum.
75 HP Meade Morrison sgl. fric. drum.
75 HP Diamond sgl. fric. drum.
200 HP Vulcan dbl. drum shaft.
300 HP Lidgerwood sgl. fixed drum.

STORAGE BATTERY LOCOMOTIVES

6 Ton G.E. perm. 36/44" Ga. HM 825 BB.
5½ Ton Ironton Type A 36/42" Ga.

MINING MACHINES

112 EJ Goodman 230 v. DC 7½' bar.
35 B Jeffrey Perm. 230 v. 7½' bar.

M-G SETS—ROTARIES (3 ph. 60 cy.)

450 KW G.E. 250 v.—710 HP. G.E. Syn. 2300 v.
300 KW West. 250 v.—435 HP Syn. 2300 v. 1200 RPM.
300 KW G.E. Rotary 250 v with 3-110 KVA 2200/4000 v. Transformers.
300 KW 250/125 v. con. 2-150 KW West. SK 125 v. Gen. dir. con. 450 HP Motor.
250 KW West. SK 250 v.—350 HP ATI Syn. 2300 v. 1200 RPM.
100 KW West 125-150 HP West. Ind.
75 KW 75 v. West.—100 HP West. Ind.
50 KW 125 v. G.E.—75 HP G.E. 2200 v.
35 KW G.E. 125 v.—50 HP 220/440 v. Ind.
10 KW Bardco 125 v.—15 HP 220/440 v.

COAL CRUSHERS

18x24 and 18x30 New Scottdale dbl. roll.

AIR COMPRESSORS

750 cu. ft. 100 lb. pres. Chic. Pneu. 2 stage Type OCB 17 and 10x12".
356 cu. ft. 100 lb. pres. Chic. Pneu. 12x10.
245 cu. ft. 100 lb. pres. Ing. Rd. ER1. 10x10.
164 cu. ft. Chic. Pneu. Steam Type.

DC MOTORS

HP	Make	Voltage	Wdg.	Speed
7½	West. SK 43	230	cp.	1150
7½	G.E.	230	sh.	1750
7½	West.	230	cp.	1050
10	West. SK	230	cp.	1150
10	G.E. CD	230	cp.	1750
13	West. SK	230	sh.	875
15	West. SK 93	230	cp.	850
15	Cr. Wh.	230	sh.	1750
15	West. SK 110	230	cp.	750
20	West. S 6	230	cp.	975
20	Al. Ch. BBDP	230	sh.	1150
20	Cr. Wh. BB	230	sh.	1150
30	West. S 7	230	sh.	1025
30	West. SK 93	230	cp.	1750
40	G.E. RC	230	sh.	1150
40	G.E. RC	230	sh.	750
50	West. SK	230	sh.	1750
75	Rel.	230	sh.	850
75	West. SK 153	230	sh.	1150
125	West. SK 193	230	sh.	450/1000
200	G.E. RC	550	cp.	875
200	West. SK 201	230	sh.	400/800
375	West.	230	cp.	430/860

AC MOTORS (3 ph. 60 cy.)

HP	Make	Wdg.	Spd.	Type
300	West.	S.R.	600	CW
300	West.	S.R.	450	IM
250	Al. Ch.	S.R.	435	——
160	G.E.	S.C.	——	IK
150	G.E.	S.C.	695	KT
150	G.E.	Syn.	600	ATI
125	West.	Syn.	277	——
100	G.E.	S.R.	450	IM
100	Al. Ch.	S.R.	600	——
75	West.	S.C.	860	MS
60	West.	S.C.	1200	CS505
75	G.E.	S.R.	575	ITC
50	Al. Ch.	S.C.	1750	——
40	G.E.	S.C.	860	KT
35	G.E.	S.C.	1200	IK
30	G.E.	S.C.	1200	KG405
25	Cr. Wh.	S.C.	600	——
25	Cr. Wh.	S.C.	860	——
25	Cr. Wh.	S.R.	600	——
20	Cr. Wh.	S.C.	900	——
15	L. A.	S.C.	3600	——
15	West.	S.C.	1750	W326
10	West.	S.C.	860	CS
10	West.	S.C.	1160	CS
10	West	S.C.	570	CS566C
7½	Comm.	S.C.	865	P326
5	West.	S.C.	565	CS546
5	West.	S.C.	1150	CS
3	Cent.	S.C.	1750	——

REDUCTION UNITS

500/700 HP Morse Chain Drive. 4.28 to 1.
300 HP V Belt dr. pulleys 30" and 48" supported by 2 roller bgs. with pedestals.
150 HP Nuttall 1.6 to 1.

MOORHEAD ELECTRICAL MACHINERY CO. MAyflower 7900 Pittsburgh 19, Penna.

5 PITS serviced by West Virginia–

THE West Virginia-Pittsburgh Coal Company is using a high-speed, rubber-tired C Tournadozer to maintain five widely separated pits of the Locust Grove mine at Collier, W. Va. Tournadozer cleans up around 5 shovels in the 5 pits, cleans the coal seam in each, levels spoil, clears snow from haul roads and works as an all-round utility dozer . . . travels job-to-job and pit-to-pit at 15 m.p.h.

5 hour Crawler trip in 30 min.

Track-type tractors, required 5 hours to travel from pit # 5 to tipple over back roads open to crawler use. ***Tournadozer, traveling a shorter route ...8 miles...via macadam roads, makes this trip in 30 minutes.***

Owner says *TOURNADOZER* handles 50% more spoil

F. A. Howe, owner, says, "For our kind of work, it does a good job anyplace we put it . . . will doze about 50% more spoil than a crawler. Last winter it did a swell job cleaning a 10-inch snow from our roads . . . in considerably less time than a tractor. Due to its speed and mobility, it can work all of our pits . . . saves us one to two tractors."

Operator likes its speed...comfort

J. Ross Denham, of St. Clairsville, Ohio, likes the easy-riding 180 h.p. Tournadozer. "You don't get that 'old jar' . . . it's fast on dozing spoil . . . can make 1½ cleaning passes to a dozer's one.

"I like the easy greasing too . . . been operating crawler dozers for 20 years and I like everything about Tournadozer . . . it's sure easy to handle . . . you can be gone while a tractor is changing gears."

Faster on any dozing job

Because of the Tournadozer's high speed, instantaneous shift, faster dozing speeds, faster reverse speeds, you get more work cycles per hour on stripping overburden, haul road maintenance or any dozing job. Because of its faster travel speed on rubber the Tournadozer handles more jobs per day.

For complete information on the revolutionary rubber-tired dozer, contact your nearest LeTourneau Distributor.

Tournadozer—Trademark CM18

Tournadozer speeds along haul [illegible] between pits and tipple . . . [illegible] pressure, giant rubber tires [illegible] plenty of traction in soft going . . . soft tires do not chew up any type of road surface.

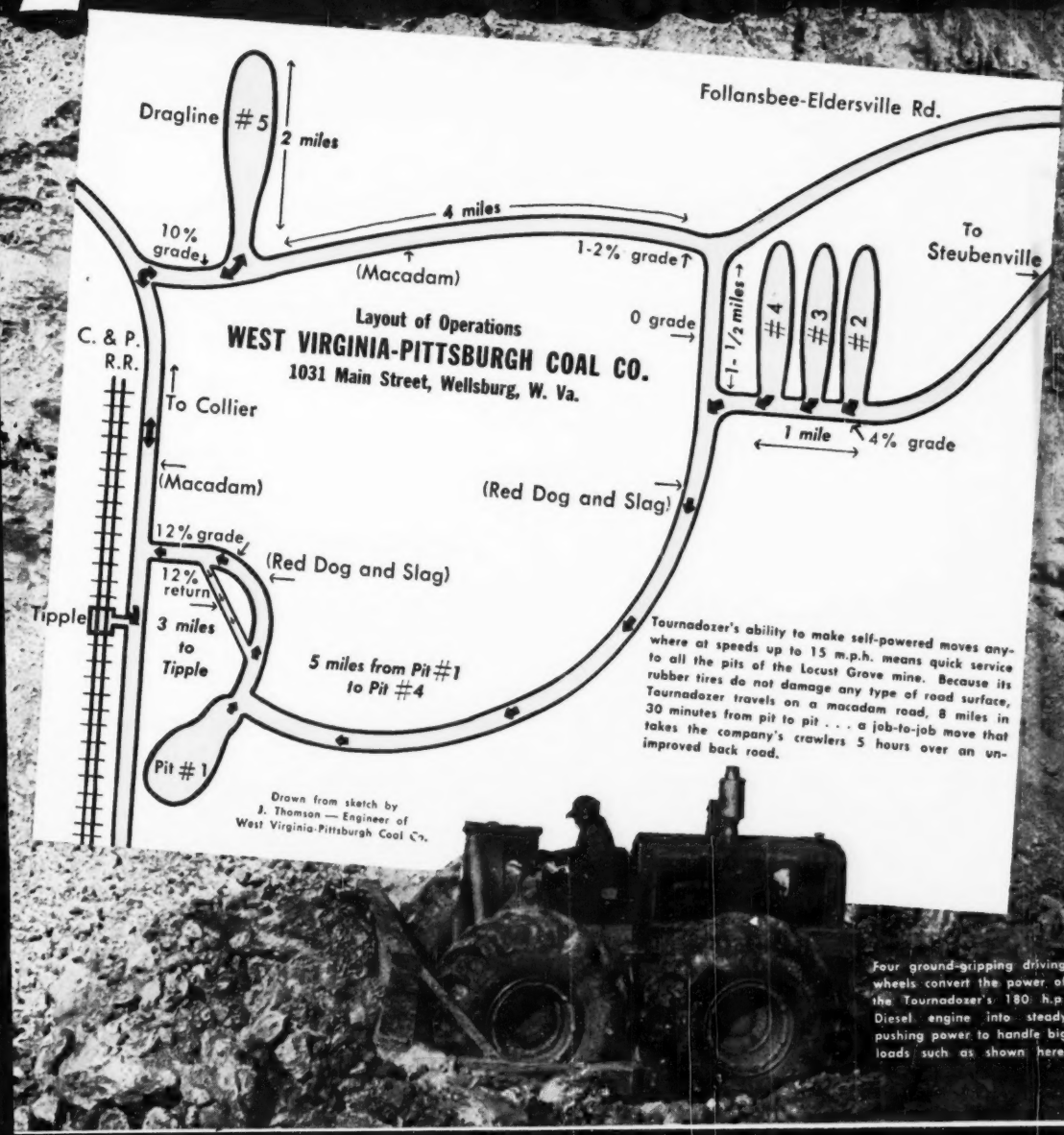
LETOURNEAU EQUIPMENT

FURNIVAL MACHINERY CO.

Lancaster Avenue at 54th St., **PHILADELPHIA 31, PA.**

S. E. Cor. North Cameron & Forster Sts., **HARRISBURG, PA.**

1 TOURNADOZER at Pittsburgh Coal Co.


Dragline #5
2 miles
Follansbee-Eldersville Rd.
4 miles
10% grade
(Macadam)
1-2% grade
To Steubenville
Layout of Operations
WEST VIRGINIA-PITTSBURGH COAL CO.
1031 Main Street, Wellsburg, W. Va.
0 grade
1-½ miles
#4
#3
#2
C. & P. R.R.
To Collier
1 mile
4% grade
(Macadam)
(Red Dog and Slag)
12% grade
(Red Dog and Slag)
12% return
Tipple
3 miles to Tipple
5 miles from Pit #1 to Pit #4
Pit #1
Drawn from sketch by J. Thomson — Engineer of West Virginia-Pittsburgh Coal Co.
Tournadozer's ability to make self-powered moves anywhere at speeds up to 15 m.p.h. means quick service to all the pits of the Locust Grove mine. Because its rubber tires do not damage any type of road surface, Tournadozer travels on a macadam road, 8 miles in 30 minutes from pit to pit . . . a job-to-job move that takes the company's crawlers 5 hours over an unimproved back road.
Four ground-gripping driving wheels convert the power of the Tournadozer's 180 h.p. Diesel engine into steady pushing power to handle big loads such as shown here.

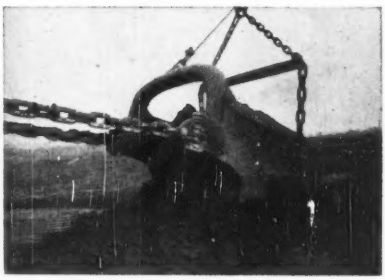
DRAVO-DOYLE CO.
2601 Preble Avenue
N. S. PITTSBURGH 12, PA.

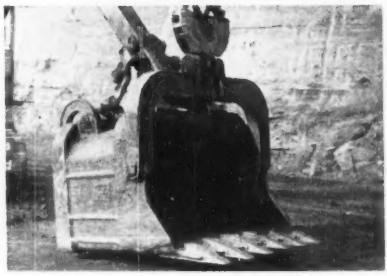
BALDWIN MACHINERY CO.
P. O. Box 2427, CHARLESTON, W. VA.
307 North Avenue, CLARKSBURG, W. VA.

Strongest Per Pound . . .
More Payload Per Pass

ESCO

DRAGLINE BUCKETS





Are made of wear resisting Manganese Steel which polishs in use, minimizes friction, becomes harder and tougher the more it works. Hollow arch construction reduces weight and increases strength.

Built For Long Life

ESCO buckets outlast other makes and operate with less maintenance work and expense.

Designed For Efficient Digging

The clean cutting lip of ESCO dragline buckets contains integrally cast streamlined tooth horns. LONG, SHARP, TEETH are placed for maximum efficiency with outside teeth placed near edges to make the bite WIDER and digging easier.

Coal Strippers Know

That they can often use larger size ESCO buckets than would be possible with other makes, due to maximum strength without excessive weight.

An Esco Bucket For Every Job.

Made in four types: Medium, Stripping, Standard and Heavy Duty, in sizes from 3/8 to 18 yards.

Made by **ELECTRIC STEEL FOUNDRY CO.**
PORTLAND 10, OREGON
728 PORTER ST., DANVILLE, ILL.

Sold by:

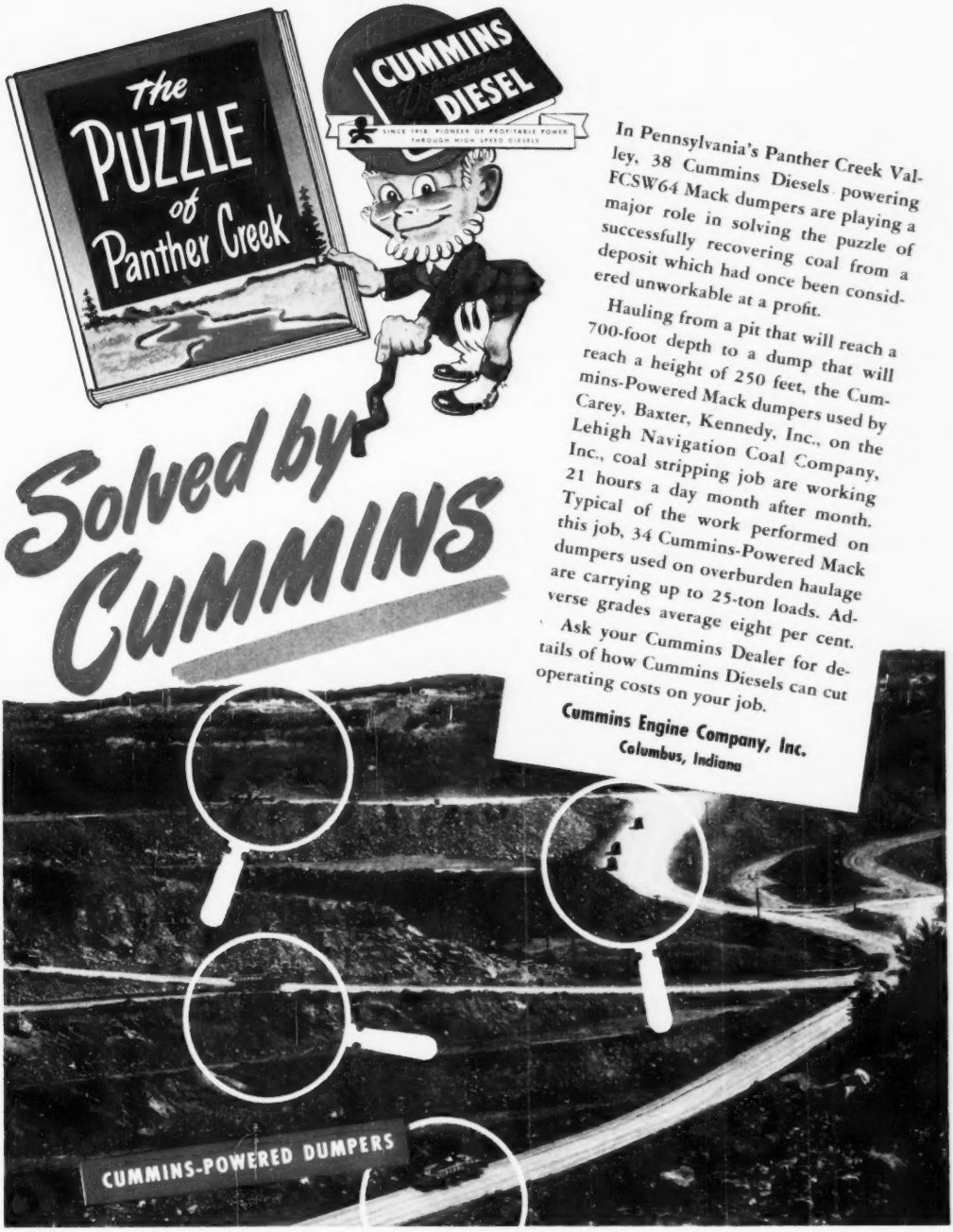
KANAWHA STEEL & EQUIPMENT COMPANY

CHARLESTON 1, W. VA. Telephone Charleston 33-615

Pittsburgh Representative: JOHN W. PATTERSON CO.
Rook Station Phone: Carnegie 3500 Carnegie, Pa.

Dippers for Any Model and All Makes of Shovels • Manganese Drag Chains • Dump Blocks and Shackles

HAZARD WIRE ROPE


The PUZZLE of Panther Creek
CUMMINS DIESEL
SINCE 1918 PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS
Solved by CUMMINS
CUMMINS-POWERED DUMPERS

In Pennsylvania's Panther Creek Valley, 38 Cummins Diesels powering FCSW64 Mack dumpers are playing a major role in solving the puzzle of successfully recovering coal from a deposit which had once been considered unworkable at a profit.

Hauling from a pit that will reach a 700-foot depth to a dump that will reach a height of 250 feet, the Cummins-Powered Mack dumpers used by Carey, Baxter, Kennedy, Inc., on the Lehigh Navigation Coal Company, Inc., coal stripping job are working 21 hours a day month after month. Typical of the work performed on this job, 34 Cummins-Powered Mack dumpers used on overburden haulage are carrying up to 25-ton loads. Adverse grades average eight per cent.

Ask your Cummins Dealer for details of how Cummins Diesels can cut operating costs on your job.

Cummins Engine Company, Inc.
Columbus, Indiana

SEE YOUR CUMMINS DEALER

CUMMINS DIESEL ENGINES, INC.

209-13 N. 22nd St., Philadelphia 3, Pa., Tel. RI. 6-4460

Branch: 2nd and Orange Sts., Mount Carmel, Pa., Tel. 1261

Branch: 6501 Hamilton Ave., Pittsburgh 6, Pa., Tel. Montrose 9784

Branch: Light and York Sts., Baltimore, Maryland, Tel. South 1281

DUST-PROOFING WITH

PERMATREAT COAL SPRAY

MEANS *Cleaner* YEAR 'ROUND DELIVERIES

Permatreat is the answer to more deliveries of coal in summer, for housewives know dust-proofed coal won't cause additional housecleaning. More summer sales mean more time for fall and winter deliveries and thus greater profits through additional deliveries. You'll find domestic consumers "sold" on coal as a fuel when it's dust-proofed.

Ashland Permatreat Coal Spray can be furnished in low, medium and high viscosity ranges to treat all grades of coal. Talk it over with an Ashland representative. He'll gladly give you the facts and help with any preparation problem. Write today!

ASHLAND OIL & REFINING COMPANY
Ashland, Kentucky